THE AMERICAN GAS LIGHT JOURNAL

PUBLISHING OFFICE No. 42 PINE STREET

DEVOTED TO THE INTERESTS OF ILLUMINATION, VENTILATION, WATER SUPPLY AND DISTRIBUTION, & GENERAL SCIENCE.

VOLUME XXXVIII., No. 12. Whole No. 576. | NEW YORK, SATURDAY, JUNE 16, 1883. | $3 PER ANNUM IN ADVANCE.

A. M. CALLENDER & CO., Proprietors. C. E. SANDERSON, Manager. ——————, Editor.

ENTERED AT THE POST OFFICE AT NEW YORK, N. Y., AS SECOND CLASS MATTER.

Terms of Subscription, Including Postage.—For the United States and Canada, $3 per annum. European countries, $3.50 (15 shilling—18 francs). All payments to be made in advance. Single copies, 15 cents.

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OBITUARY—GEORGE WARREN DRESSER.

The long-protracted and agonizing illness of Major G. Warren Dresser culminated in his death at the Reitz cottage, Newport, Rhode Island, on the afternoon of Sunday, May 27th. It is with no ordinary feelings of sorrow and regret that we here attempt to place before our readers a sketch of the life and work of our departed friend and chief, and know that so much of the record as pertains to Major Dresser's career in connection with the United States military service must necessarily be very imperfect, from the fact that he never cared to discuss events in which he bore a prominent and distinguished part.

Major Dresser was born in Abington, Connecticut, on the 15th day of September, 1837. In his early boyhood he showed a decided liking for military life, and was placed in the Worcester (Mass.) High School, and subsequently transferred to the Andover (Mass.) Academy, from which institution he graduated in the summer of 1856. He passed the preliminary examination, and entered the West Point Military Academy in July of the same year. During the course of his studies at West Point he displayed great aptitude for mathematics, and won the unqualified approval of his superiors and tutors, and gained the thorough and lasting friendship of his associates and classmates. He graduated with the May class of 1861, and entered upon his military career when the Nation had manifest and urgent need of the services of just such clear-headed, stout-hearted men as the young cadet and his brother comrades were. He was commissioned Second Lieutenant of the Fourth United States Artillery, and went into active service on the sixth of May, 1861. During the months of May and June of that year he was detailed to assist in the drilling of the recruits joining the service at Washington, D. C. He entered the Manassas campaign as First Lieutenant, and took active part in the famous battle of Bull Run, and in the subsequent defense of the city of Washington, D. C. He entered upon the Virginia Peninsular campaign in 1862, and was assigned to engineer duty at the siege of Yorktown; at this period he was Acting Ordnance Officer of the Third Army Corps, which position he held for the space of about two months. From September, 1862, until August, 1863, he was detailed as Assistant Instructor of Artillery Tactics at West Point. During the remainder of 1863 he was assigned to engineer duty, and the command of his company, the Fourth Artillery, at Chattanooga, Tenn. While on duty at this point an incident occurred which will serve to illustrate the courage and skill of the young artilleryman—

The point at which the Chattanooga division was concentrated, at this particular time, was situated some 86 miles from the base of supplies. The roads were very bad, and the surrounding country swarmed with detached bands of Confederate guerillas, who paid particular attention to the harassing and destruction of the trains destined to convey supplies to the Federal soldiers. The marauders had been very successful in their efforts to intercept the supply trains, and the Federal troops suffered much hardship in consequence. On the other end of the line, some nine miles distant, the confederates were in possession of a river, on the south bank of which they had a strongly intrenched redoubt, garrisoned by a large force of picked men. General Grant, who had command of the Union forces at this point at the time, decided that the only thing to do was to bridge the river, and, if possible, drive the enemy from shelter. General W. F. Smith, well known as "Baldy," was summoned by General Grant, and ordered to undertake the perilous task. Gen. Smith selected the subject of this memoir to take charge and direct the operations of building the pontoon bridge, and to lead the

assault. The young Lieutenant, in the face of a most galling fire from the redoubt on the opposite side of the river bank, successfully built the bridge, and in the subsequent charge routed the Confederates, and the future supplies of the Chattanooga division of the Federal army were assured.

He was appointed Inspector of the Fifth Army Corps in July, 1864, retaining the position until March, 1865 ; and during the ensuing four months was on detached service, on the staff of General "Baldy" Smith, in New Orleans, and New York city. He was brevetted Captain in August, 1864, for gallant services on the Weldon (Va.) Railroad, and made a regularly commissioned Major, March, 1865, in recognition of his gallant and meritorious services on the field during the war of the rebellion, resigning his commission on March 13, 1865.

Upon severing his connection with the United States Military Service Major Dresser devoted his attention to the practice of the profession of civil engineering, and from 1866 to 1868 acted in the capacity of assistant engineer on the government works in Narragansett Bay. While acting in this capacity he made the examination and surveys for the location of the Block Island Breakwater, and also had charge of the engineering details at Fort Adams, Newport, R. I. In 1869 he was resident engineer in charge of the Portchester Railroad. In 1870 he surveyed, located, and built the Wickford (R. I.) Railroad. From 1870 to 1873 he was engineer in charge of the extensive alterations made on the Croton Aqueduct, from 92d to 113th street, in this city, Mr. E. H. Tracy being chief-engineer of the Croton Aqueduct department. This work was one of great magnitude, and the manner of its construction has been thoroughly shown in the work it has done. Upon the completion of this structure he was engaged in various matters as consulting engineer, and his advice on many engineering matters, both large and small, was constantly solicited. In October, 1875, Major Dresser assumed the editorial control of this Journal, and continued uninterruptedly in that position to the day of his death.

On October 21st, 1875, Major Dresser was elected an honorary member of the American Gas Light Association, at its third annual meeting, held at Masonic Temple, in New York city ; and no other man will be more missed from the annual gatherings of this body. December 1st, 1875, witnesssed the formation of the Society of Gas Lighting, and at the first annual meeting the Major was chosen secretary, and has since been chosen to perform the duties of this office. He was elected an active member of the American Society of Civil Engineers on July 5th, 1876, and was made a director of the same society in the year 1882. In the doings of this influential and powerful body of intelligent and aggressive men he was always prominent. He was elected a member of the Vestry of Trinity Church, New York city, on April 3d, 1877, representing St. John's Chapel in that body, and held the same position each successive year.

Major Dresser visited Europe on three occasions. His first visit (1878) was made in the capacity of the representative of the gas lighting interest of the United States, to investigate and report upon the status of the electric light. It will be remembered that the "arc" system of lighting had received great impetus from the introduction of the Jablochkoff candle, and that the world of artificial illumination was all agog over the surprising statements made by the latest projectors of the old-new system. The glamour which surrounded the Avenue de l'Opera, in Paris, did not blind the clear perception of the Major to the defects, high cost, and inequality of the system ; and the report which he made upon the subject, published shortly after his return, has since been amply verified.

The second visit (1881) was made in connection with the introduction of the Ross stoking machinery to the notice of the European gas fraternity. It was at this time that he was elected an honorary member of the British Association of Gas Managers (now the Gas Institute), and also made an honorary member of the French Association of Gas Engineers.

The third and last visit (1882) was necessitated by the failing health of his accomplished and estimable wife, to whom he was united in marriage at Calvary Church, New York city, on April 21st, 1863. Mrs. Dresser's maiden name was Susan Fish Le Roy, and was a daughter of Daniel Le Roy, an old and respected resident of this city. The tender object of his third visit to Europe failed of success, for Mrs. Dresser did not rally from the wasting disease which prostrated her, and he himself there first experienced the symptoms of the trouble which laid such vigorous and fatal siege to his robust frame. Mrs. Dresser passed away painlessly and peacefully in the first week of April of this year, and the faithful partner of her happy, tranquil wedded life was not long separated from her.

As stated previously, he died at Newport, R. I., on the 27th of May, and was buried from Trinity Church in that city on May 30th, the Rev. Geo. J. Magill officiating. The pallbearers were Messrs. C. V. Smith and Albert M. Smith, of the Manhattan Gas Light Company, of this city; Mr. M. S. Greenough, of the Boston Gas Light Company, Boston, Mass.; Mr. E. A. Crocker; Messrs. H. A. Bently and Captain Judson, with whom he was associated in the engineer corps ; Captain Morris, and Major Throckmorton, of the regular army, and stationed at Fort Adams, as also Captain Churchill and Mr. W. D. King. The gathering of the gas fraternity at the funeral was large and representative, called together as they were to pay the last sad offices of respect to one who, though now cold in death, had been very intimately associated with them for a number of years.

IN MEMORIAM.

"Soldier, sleep; thy warfare o'er—"

The necessarily brief, and somewhat imperfect, sketch which we have given above of the military and civil career of our departed chief will serve to show the energy of his character, and the vitality and variety of his talents. The cold type may easily be made to tell the story of the public actions of his life, but how wretchedly they fail when asked to chronicle the record of his inner self. Can they bring back to mind his hearty presence, the warm grip of his friendly hand, the cheering effect of his wise counsel? Only one answer comes back to these mournful questions—and that is the negative of silence. To those who were acquainted with the full knowledge of Major Dresser's sufferings during the last seven weary months, the tidings of the final ending brought with them thankfulness that his martyrdom was over. It is simply impossible to describe his fortitude and courage during the progress of the disease from which he suffered—let it suffice to say that the same spirit which animated the breast of the young artilleryman at Chattanooga in 1863 survived with him to the last, and upheld him to the close.

It was singularly fitting and appropriate that the last sad rites of sepulture should be held on the day set apart by the country to revive in the hearts of its citizens the memories of those brave men who gave up their lives to secure it greatness ; and in perfect unison and accord with the memories so evoked were the thoughts of those who assisted in the services which were celebrated in the chapel where, with his family, he had so frequently been a devout attendant. And while the earth may enshroud him in the gloom of the grave, there will still always remain with those who knew him best and loved him most the consolation that while with them in this life, the paths which he trod were those of the brave soldier, the scholarly engineer, the loving husband, kind father and true gentleman.

DEATH OF MR. WILLIAM H. PRICE OF CLEVELAND, OHIO.

It was hoped and so stated in the last number of the JOURNAL, that Mr. William H. Price was in a fair way towards recovery from the complication of diseases which had prostrated him for the past nine weeks. The improvement noted in his condition proved to be but the last effort of his strong will. The demise of this estimable gentleman occurred on Friday, June 8. Mr. Price was born in Austinburgh, Ashtabula County, Ohio, in 1818, receiving a collegiate education at the Grand River Institute. It was his intention to fit himself for a legal career, but afterwards decided to engage in mercantile pursuits.

He went to Cleveland, Ohio, in 1855, and joined the firm of Stilson & Leek, extensive dealers in drygoods, notions, etc. In 1868 Mr. Price was elected President of the Cleveland Gas Light and Coke Company, which position he has held ever since. In 1842 Mr. Price married Miss Anna Guild, of Austinburgh, who died some five years ago.

Mr. Price was one of the original founders of the American Gas Light Association, and at the initial meeting of the gentlemen who assembled in New York city, on April 16, 1873, for the purpose of organization, he was one of the committee of six appointed to draft a constitution and by-laws. It will be remembered that the original designation of this body was "The Gas Light Association of the United States." When the body had permanently organized, Mr. Price was elected as second vice-president; was re-elected to the same position in October, 1873 ; becoming first vice-president in 1874, and continuing as such up to October, 1879, when he was elected to the presidential chair, succeeding Gen. Charles Roome, of New York City, who had acted as president up to that date. He was re-elected to this position in 1880, and was succeeded in 1881 by Gen. Hickenlooper of Cincinnati.

The success which has attended the efforts of the American Gas Light Association is in a great part due to the zeal and watchfulness of Mr. Price, who was always untiring and active in his exertions in its behalf. He was a gentleman of broad culture, an eloquent speaker, a deep and original thinker, an uncommonly entertaining conversationalist, and a vigorous and terse writer. He was one of the foremost men in the gas fraternity of the country, and his opinions on matters relating to business were always given the attention and consideration which they so justly merited.

Mr. Price was a thoroughly public-spirited man, and was admired and beloved by his fellow-citizens for his liberal and energetic qualities, and in his death Cleveland losses one of its brightest men.

The funeral took place from his late residence, No. 1325 Euclid avenue, Cleveland, Ohio, on Tuesday, June 12, at 2:20 P. M. ; the pallbearers were Messrs. J. H. Morley, D. P. Eells, F. A. Sterling, O. J. Hodge, and D. M.

and C. C. Baldwin. The interment was made in Woodland Cemetery. The most appropriate panegyric that can be spoken of our deceased friend and fellow-worker will be to point to the nobility of his character and work, and of him it may be truly written "He died full of years and honors."

THE CENTRAL NEW YORK MEETING.

The Bradford Meeting of the Central New York Gas Engineers Association was in all respects a thoroughly enjoyable affair, and we made no mistake in saying that all those who could possibly attend it should be on hand. The Bradford Gas Light and Heating Company, and Brother Wood, of Syracuse, proved themselves noble entertainers, and everything that could be done was done. The New England Association was well represented, and some of the "other gas men" were there too. The oil wells somehow or other did not appear to carry terror or dismay into the hearts of the rank and file of the visitors; but then, gas men never "did scare worth a cent." Mr. A. C. Wood read a paper on "The Present Condition of the Coal Gas Interest in its Relation to other Processes and the Electric Light," and Mr. George Shepard Page forwarded a paper on "Ammonia." The report of the meeting will be found in the succeeding pages of the JOURNAL. Mr. Page's paper was forwarded too late for publication in this number, but will appear hereafter. Mr. McDougall was re-elected as President, and Mr. W. A. Wood was chosen as Secretary. We wish here to extend our thanks to Mr. Wood for courtesies received at his hands in connection with this meeting.

THE GAS INSTITUTE.

The annual general meeting of the members of the Gas Institute for 1883 was held at the Firth College, Sheffield, England, on the 12th, 13th, 14th and 15th days of June. From the report of the Council we learn that the membership of the Institute has had a net increase of 72 names, the total number on the rolls being 796, divided as follows: Honorary, 20; ordinary 650; extraordinary, 77; associates, 49.

There were submitted to the consideration of the Association ten papers on technical subjects. Among these, a paper by Mr. T. Fletcher, of Warrington, on "The Theoretical and Practical Construction of High Power Burners for Heating, etc.," as also that presented by Mr. Frank Livesey, of London, on "A Description of Three Different Methods of Sulphur Purification," possess unusual interest for the American gas maker.

The Management of Small Gas Works.

By C. J. RUSSELL HUMPHREYS.

[Continued from page 243.]

In cases where the hydraulic seal is retained, two points must be secured, else a very heavy pressure will be thrown on the retorts. First, the hydraulic main must be adjusted to a perfect level each way; that is, cross-wise as well as longitudinally. Secondly, the tar overflow should be tapped into the bottom of the main, so as to draw off the heavier tar first.

The first desideratum is very difficult of attainment, and it is on this account that anti-dips have been so generally adopted. A main may be set perfectly level when first erected, but is soon thrown out of line by the settling of portions of the bench work.

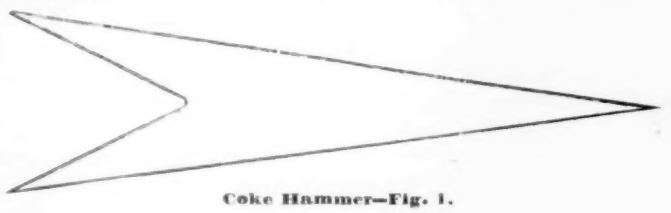
If it be desired to carry not less than ¾ of an inch seal on the dip pipes, the main being a ½ inch out of the level, those pipes at the lower portion of the hydraulic will have a seal of 1¼ inches. Should the settling of the main be discovered before it has assumed serious proportions, it will be comparatively easy to rectify the evil; but the difficulty being permitted to go on, it will prove well nigh impossible to bring it to its true position again without endangering some of the joints.

Relative to the second matter, it is to be noted that the pipe forming the tar overflow should be carried upon the outside to about the height of the liquor in the main, and a regulating gate inserted at that point. A gauge should be attached to this valve so that the depth of the seal can be quickly ascertained.

There still remain a few points in connection with the retort house, on which we must touch before passing on to other subjects. For economy's sake the ashes from the pans under the furnaces may be saved and screened through a ¼-inch screen, the cinders serving to burn with coke in the boiler fire. The objection may be raised to this recommendation that it would be paying too much for a penny's worth. We would reply it is paying nothing for a cent's worth, because the work can be performed when there is nothing else for the men to do.

We would also note that all openings in the retort house walls, save the doorways, should be above the top of the benches, as draughts blowing on the face of the setting have a bad effect on the heat. In our imaginary works we have provided against this difficulty by having heavily glazed windows for affording light to the interior of the house.

We have already remarked that, in our works, ample storage room will be allowed for the coke on the ground floor of the retort house, thus effecting a decided saving in the cost of barrowing. As there is an entrance at the end of the house for the carts, we can load them in the cellar. For loading the coke into the carts we will use the patented coke shovels which permit the dust to drop through, thus avoiding the expense of screening. It may be possible to sell all of this residual to bakers, who make use of it in their large ovens; in such an event it will not be necessary to crush it. If, however, there be any difficulty as to its disposal, we will have the coke broken and make a market for it among the householders. The latter plan is preferable, even though we have an opportunity to sell all of the material to one or two factories; it is poor policy to depend upon one party for the sale of the residual in question, for the reason that such a person, finding a cheaper fuel than the coke, or going out of business, may leave us with an inconvenient surplus on hand. It is well, then, to have a number of small coke customers rather than to sell all of the product to one party. For breaking the coke, a hammer made especially for that purpose is the handiest tool for a small works. The annexed cut shows the kind of tool to which we refer—figure 1 being an elevation, and figure 2 being a plan of the same. It



Coke Hammer—Fig. 1.

Coke Hammer—Fig. 2.

can easily be made by any blacksmith. The coke should be reduced to lumps about the size of stove coal. In fixing on the price for broken coke, allowance must be made to cover labor, the loss by some of the article being reduced to dust, and also, when sold by measure, for the fact that the lumps being small, more will be filled into the standard used for gauging it.

A man will break a chaldron of coke in about three-quarters of an hour; during the process, about 10 per cent. of it will be pulverized, and when the broken coke is loaded into the measure it will be found to contain about 6 per cent. more of it than it would of large coke.

In the event of the coke being so dirty that the use of the screening shovels will not clean it sufficiently, it will be well to resort to the cylindrical sieve. This will necessitate having two men, because one man must turn the cylinder while the other dumps in the coke. In case there is but one man to do this work, the common straight screen will have to be resorted to; but instead of setting it on the ground and shoveling the coke against it, it will be better to set it on a framework, at an angle of about 60° with the ground, and having its lower end about 3 feet from the floor. An incline way of about 15 feet may be used for reaching the dumping stage.

The coke dust, or breeze, may form part of the fuel for the boiler fire. It will possibly entail too much labor to keep up steam with it in winter when the buildings have to be heated; if so, the dust may be allowed to accumulate through this part of the year and be worked off during the summer months, when the demand for steam is light. In works of considerable magnitude, where there is a large quantity of this waste, it can be used alone for boiler fuel with the aid of a blower.

As regards labor, in the works we have planned it will be necessary to employ three men in all. In winter we will work the two men during the day and one at night; the third man will not be needed for indoor work in summer, but he can probably be kept busy with outside jobs—laying mains and services, and making other extensions. It is well to have one man around the works trained to the blacksmith's trade, so that the retort house tools can be made and repaired without calling on the village smithy, who, whatever he may be in poetry, is certainly, in prose, a rather expensive artisan. We can hardly quit this section of our task without a word relative to high and low yields; we do not, however, intend to dwell at any length on this topic, on the contrary will content ourselves with a mere expression of opinion without going into an argumentative examination of the subject. Our idea then, is that, with the standard caking coal, a yield of 11,000 feet to the ton can be taken with the additional use of five per cent of cannel. To try to attain to 12,000 feet is, in our opinion, unwise; neither should we be content with 10,000 feet.

[To be continued.]

[Official Report.—Continued from page 249.]

Sixth Annual Meeting of the Western Gas Association.

Held at the Burnet House, Cincinnati, Ohio, May 9, 10, and 11, 1883.

First Day—Morning Session—May 9.

WEIGHTS AND MEASURES.

On motion of Mr. King, a committee was appointed to prepare a standard of weights and measures to be employed by the members of the Association in making experiments, etc. The committee was further instructed to make the table correspond to that in use by the American Gas Light Association. Mr. King, in explanation of his motion, stated that it was his idea to add to the standard of weights and measures certain rules which were to be followed by each member of the Association in arriving at results, so that all could work harmoniously together, and be thus placed in a position to conveniently and accurately compare results with each other. The Chairman named as such committee Messrs. E. J. King, Jacksonville, Ill.; James Somerville, Indianapolis, Ind.; and G. A. Hyde, Cleveland, Ohio. The committee was directed to report to the Secretary of the Association, and the Secretary was instructed to see that each member received a copy of the report.

REPORT OF COMMITTEE ON ENTERTAINMENT.

Mr. Fullager—A committee has been appointed for the entertainment of members of the Association, and is now present. It is composed of the manufacturers, coal dealers, and those interested in gas manufacture in this vicinity; and they tender you a hearty welcome to the city of Cincinnati. The committee has made arrangements for your entertainment to-morrow. It is proposed to leave here at 11 o'clock, to go from here to Newport, to visit the works of the Cincinnati and Newport Iron Pipe Company; then visit the Covington gas works; thence to Taylor & Anderson's retort and fire brick works, at Price's Hill; thence to the Zoological Garden, where you may have a view of the bears and baby hippopotamus; then we can return and have another session here in the evening. I hope all the members will remain here on Friday evening and be present at the banquet, to which each and every member will be most heartily welcomed. The committee has gone to considerable trouble to entertain you, and hopes you will all remain and enjoy what has been offered you.

On motion of Mr. Pratt the invitation of the committee was accepted.

COMMITTEE TO NOMINATE OFFICERS, ETC.

The President—I will appoint as the committee on nominations of officers for the next year Messrs. G. G. Ramsdell, Vincennes, Ind.; A. T. Averill, Cedar Rapids, Iowa; and T. Smith, Grand Rapids, Mich.

I will also appoint, as a committee to recommend the place for holding the next annual meeting, Messrs. R. Spencer, Burlington, Iowa; J. Fullager, Cincinnati, O.; and T. G. Foster, Montgomery, Ala.

The Association took a recess till 2 o'clock P.M.

Afternoon Session—May 9.

Mr. E. J. King (Jacksonville, Ill.) read the following paper on

THE GAS STOVE.

Having placed some 40 gas stoves, for which separate meters were set, during the past season, I am enabled to present some figures for your consideration to-day which I hope may prove of interest and profit. Having introduced the smaller stoves into very general use, we were desirous of starting the larger ones, and to this end made our consumers the following proposition: That we would place a stove for them, not to be of less size than would correspond with the "Retort" No. 6, on one month's trial, free of all expense. At the end of that time, if found satisfactory, we would either rent them the stove for 50 cents a month, or sell it to them for the actual cost, charging nothing for the pipe or fitttings; and that we would sell them the gas for cooking purposes at 75 cents less per thousand feet than for illumination.

As we did not begin to set them until the first of June, and were continually setting them throughout the season, the result will not show as satisfactorily as it would had they all been in place during the whole of the heated term.

The total number of stoves set was 45, at a cost to us, for stoves, meters, piping, etc., less cash received for stoves sold and rent collected..	$1,190 00
Adding interest for year, at 8 per cent.....	95 20
And for depreciation, 10 per cent.....	119 00
The net cost to us was.....	$1,404 20

Our sales from this source have been as follows:

June	8,200	cubic feet.
July	59,800	"
August	52,700	"
September	34,600	"
October	25,200	"
November	11,700	"
December	18,800	"
January	12,600	"
February	5,600	"
March	20,500	"
April	15,400	"
May (estimated)	35,000	"
Total	300,100	cubic feet.

This amount of gas, being sold at $2.25 per thousand, would amount to.....	$675 22
Deducting the estimated cost of gas at 50 cents per thousand.....	150 05
Our net profit would be.....	525 17

Or nearly 40 per cent. on the capital invested.

In estimating the cost of gas I have estimated only the actual cost of material used in its manufacture, as in our case we were at no other extra expense of any kind; and, as we did not vary the pressure from our regular day pressure, there could have been no extra cost for leakage.

If it be argued that this figuring is not allowable—that we could just as well figure the same for an increased consumption from any source—I would say that, granting this, and allowing the gas sold on this account the full share of the expense, there would still remain a reasonably large balance on the profit side, even for gas men. I contend, however, that my figuring must be allowed at least for the summer season, when our out-put is very light, and the increased sale of gas for stoves can easily be taken care of by the force necessarily on hand.

Now the question comes, Does it pay for the trouble and care incident to this work? We decide that, with such a showing for only 45 stoves, it does pay; and we propose from this time on to give this department of our business its due share of attention.

In regard to the matter of economy in the use of gas as a fuel the opinions of our consumers vary; but as to its convenience and comfort there is only one opinion. Of the whole number who tried the experiment only two discontinued its use on account of cost, and their bills were very moderate as compared with others who were perfectly satisfied; both of them, I believe, being less than an average.

I believe that judgment and careful management only are required to make gas as economical as wood or coal for cooking, especially if one estimates the matter of convenience and comfort as going for anything. Two cases that I recall furnish abundant proof of this. One, a family of three, the other a family of two, where the cooking was done by the lady of the house herself—in each case gas being the only means used for cooking—the consumption has never exceeded 500 feet in any one month, and has run as low as 200 feet. On the other hand, when its use has been left to the indifference or carelessness of servants, with probably more in the family to cook for, it has reached as high as 4,000 feet.

Taking the month of August as a fair average month of the hot season, the lowest consumption for any one meter was 500 feet, the highest 3,300 feet, and an average of all meters was 1,400 feet.

I claim, from my observations in this matter, that all the cooking and the washing and ironing for a family of six persons ought to be done on a consumption of from 1,000 to 1,200 feet of gas per month.

In conclusion, I would say that I believe there is a large field open to us in the sale of gas for mechanical purposes, and that it is bound to become a valued department of our business, provided we give it the attention it deserves.

Discussion.

Mr. Harthan (Selma, Ala.)—What kind of stove do you think preferable?

Mr. King—We have tried to keep a variety of stoves. We probably have more of the "Retort" in use, although we have some of each kind. We try to give the consumer his choice. We use the cabinet style altogether where we set meters.

Mr. J. Somerville (Indianapolis, Ind.)—Do you charge the same for gas sold for cooking purposes as you do for that sold for lighting?

Mr. King—No; we charge 75 cents per thousand less for that which is used for cooking.

Mr. Somerville—Why do you charge less for cooking than for lighting?

Mr. King—Because we want to encourage the use of gas stoves for cooking, and we offer every inducement that we can. During the present year people who have never used gas for lighting are inquiring as to the expense of gas for cooking, and are going to introduce it. We succeed, after a very

few minutes of conversation, in convincing people of the utility of gas for cooking purposes. We have never had any trouble on account of making a difference in price.

Mr. T. Smith (Grand Rapids, Mich.)—What do you estimate the cost of distribution to be?

Mr. King—My estimate gives the cost of the material alone as 50 cents.

Mr. J. H. Woodmansee (Danville, Ill.)—From your experience would you advise the use of the same meter for both purposes?

Mr. King—No; I would recommend the use of separate meters for lighting and cooking. I find it gives greater satisfaction to the consumer to know just what he is using for both purposes.

Mr. Somerville—I contend that that principle is wrong. If Mr. King can sell his gas for $2.25 per thousand feet for cooking purposes, he can sell it at the same price for lighting. He puts in a new meter for the gas used for cooking purposes, and then makes out two bills, one at $2.25 and the other at $3 per thousand feet. I think the principle is wrong. People will very naturally ask, if he can sell gas at $2.25 for cooking, why he cannot sell it for lighting purposes at the same price. I think that if he would put the gas down to the lowest price, and sell it at that price for all purposes, it would be better.

Mr. Lansden (St. Louis, Mo.)—There is one advantage gained by the use of two meters, one for measuring the gas used in cooking and the other for measuring that used in lighting, and that is this: You know there is a popular belief that meters are not very reliable; the people think we look at the meter merely as a matter of form, and then make the gas bills out to suit ourselves. If you have two meters in a house, the consumer will have a chance of learning that the meter does have something to do with measuring the gas consumed, for he will see that the two meters do not register exactly alike. There is another advantage in this arrangement—we have always insisted that if we could have a day consumption we could afford to furnish gas cheaper. Mr. King's method of charging for gas will emphasize that statement.

Mr. Woodmansee—There is another reason which makes it advantageous to gas companies to secure the general introduction of gas for cooking purposes and for day consumption—we thereby secure a uniform production of gas the year round.

Mr. King—Our idea was to increase the consumption. I give the results for the year to show that the consumption did keep up throughout the entire year.

Mr. Woodmansee—From your experience do you find that the people, as a rule, purchase the gas stoves, or do they prefer to pay rent for them?

Mr. King—As a rule they purchase the stoves. I think about two-thirds purchase and one-third rent. We always tell consumers that if they rent stoves, and keep them till the rent equals the cost, we will give them the stove; but if they are sent back in the meantime we do not allow the rent on account of the purchase. I allowed 10 per cent. for depreciation, but I doubt if that is enough, because, at the beginning, to use gas for cooking, every good housewife wants a new stove. They do not want a stove that has been used by somebody else. For that reason I may not have allowed enough for depreciation.

Mr. Woodmansee—At the same time, gas stoves do not depreciate as rapidly as coal stoves do.

Mr. Harthan—I tried the system of two meters at first, but afterward found it expedient to reduce the price of gas to all, and return to the use of a single meter. I sell stoves in this way: I say to the consumer, "There is a stove; I will put it up, furnish all the material, connect it, and you may use it or not. If you like it, you can keep it at a certain price. If you do not like it I will take it down again and not charge you for anything except the gas you have consumed." I have had to take back but one stove, and that was from a person who would pay neither for the stove nor for the gas.

Mr. King—My principal object was to find out just what stoves would do. We wanted to know just what amount should be credited to the stoves, and what to the illuminating gas. That was our principal object; and we have now determined the relative consumption to be as stated. What our future action may be, I do not know. I have simply given our results thus far for the benefit of others. We felt that there was a field open for us which might be made profitable if properly taken care of.

Mr. G. H. Tayler, (Warren, O.)—We have set up some 60 stoves during the last year. We make a difference of 50 cents per thousand in the price of gas, selling it for lighting at $2.50, and for stoves at $2.00. We did not put in separate meters. We have not, in a single instance, had occasion to put in a separate meter for the stove. We found no trouble in convincing the people that it was right to make a difference in price.

Mr. Woodmansee—How do you make out your bills, when the consumption is thus charged for at two prices?

Mr. Tayler—We make an estimate of the gas used for cooking by comparison with the bill of the year previous for the same period, when it was used only for lighting.

Mr. T. C. Jones (Delaware, O.)—Our works are in a town of only 8,000 people. Our Superintendent commenced sending out the gas stoves in 1879, and we already have over 200 in use. He began by distributing them, so as to give the people a chance to try them. There have been but very few returned, and the demand for them is constantly increasing. I am satisfied that this matter of using gas for heating and for cooking is going to be a very important item. A very ably written article recently published in a London paper says that steam is doomed, and that gas will take its place. In our town we have a gas power printing press, and it gives the greatest satisfaction. I am convinced, from the result of the efforts which are there being made to introduce gas, that all that is required to secure its very general use is a little effort on the part of the companies.

Mr. Somerville—We sell 9,000,000 feet of gas every year, for purposes other than lighting. This will give you an idea of what gas is now doing. We have 1,300 gas stoves in our city, and are selling them as fast as we can procure them. We have gas engines in use, varying from 2-horse power to 20-horse power. The demand for engines is increasing. I do not know what the future of gas consumption is to be, but it now looks as if the power for the future was to be furnished by gas.

Mr. King—Do you set separate meters for power gas?

Mr. Somerville—No.

Mr. King—Then, how do you get at the amount used for other purposes than lighting.

Mr. Somerville—That is not a very difficult thing to do. I do not know as we can state exactly what proportion of the gas charged for in any particular bill was used for cooking and what for lighting; but we can approximate it so closely that there is no dissatisfaction.

Mr. King—By the use of two meters I can speak definitely, while your consumption is estimated. We have some large State institutions which have been using gas for their laundries and for other work. It has been a matter of interest to them and to us to know how much of the gas consumed was used for the different purposes.

Mr. T. Smith (Grand Rapids, Mich.)—We have introduced 50 or 60 stoves for warming rooms with. The consumption of gas has been largely increased since the electric light was introduced. It has increased 1,200,000 feet since the 1st of January. We make one price—$2.00 per thousand for heating, cooking, lighting, and for all other uses. We have three engines run by gas, one of 2-horse power, and two of 8-horse power, which are used for elevators.

Mr. Woodmansee—Mr. King charges $3.00 for illuminating and $2.25 for cooking; while Mr. Smith puts it on the basis of $2.00 for everything. If Mr. King should come down to the lower price for gas, used for all purposes, it would no doubt be just as satisfactory to the people in his place. He now gets a third more than Mr. Smith does. Mr. King has determined, after a definite and positive trial, just what there is in the gas stove for the gas fraternity. By the use of two meters he has been able to ascertain how much of the increased consumption was due to the use of gas for cooking; those of us who have used but a single meter have been able only to estimate it. Mr. King knows that there is a good thing for him in gas stoves; and if there is for him, there is also for others.

Mr. King—We find that for the gas stoves there is hardly day pressure enough, and so we run a separate pipe from the meter directly from the cellar, through the floor, to the stove; and that saves us the necessity of increasing the day pressure as we would have to do if we ran the gas to the stove through the ordinary piping of the house.

Mr. T. A. Bates (Cairo, Ill.)—What pressure do you carry?

Mr. King—We carry not less than 1½ inch for day pressure.

Mr. Thomas Butterworth (Rockford, Ill.)—It is only about 2½ years since we introduced the use of gas stoves. We introduced them by virtually giving them away. We put a stove into a man's house, if he would agree to use it for cooking and pay for the gas. We put in 116 stoves on those terms, and are doing so right along. There is a big business in it. We found that the consumption of gas was so increased that we had to enlarge our mains. I do not think it is a wise policy to sell gas at a lower rate for cooking than for lighting. If you introduce gas stoves you will find that it makes the consumption almost as large in the daytime as in the night; and you want to have just the same pay for producing the gas. From our returns, for the last year, I find that we have sold 500,000 feet during the the four summer months, making a little over 100,000 feet per month for 116 stoves We issued a circular, offering to supply stoves to everybody using gas, and also to everybody on the line of piping. We did everything we could to encourage the introduction of gas. I think the price of gas should be brought down just as low as possible; and if you sell the gas cheap enough there is no doubt that the people generally will be glad to use it. There is another thing worth noticing. In our church societies they have sociables which had been accustomed to meet at the houses of the different members; but as people do not like to spend money, except for value received, they concluded, after meeting at different houses, to take a public hall for the different socie-

ties, and since then they have met in this hall. I put a gas stove into that place free, and it has been the best paying investment we have yet made.

Mr. G. A. Hyde (Cleveland, O.)—There are about 600 persons using gas stoves in Cleveland ; and we are putting in new stoves every day. We charge $1.50 per 1,000 feet for gas for all purposes.

Mr. E. L. Brown (Chicago, Ill.)—While in London last summer I called on Mr. Siemens for the purpose of seeing his grate, which burns coke and gas together. I have written for one and expect to have it placed in our office. Mr. Siemens insists that there is a great future for gas for burning, heating, and power. For twenty years I have not had much doubt about that. I should prefer to have the electric light succeed for illuminating purposes. In my opinion the success of the electric light would be the best thing that ever happened for gas companies. It would force the companies to come down to asking a decent price for gas in the first place, and that would be a great point gained. The companies to-day charging $3.00 would, in five years, make more money at $1.50. I believe that lower rates would greatly increase the consumption, and that the companies would find a corresponding profit. The advantage of large sales at small profits is just as apparent when applied to gas works as to any other industry. Having said that, I wish to inquire whether there will be any paper read or statement made with regard to gas engines. The use of gas engines, if the price be low enough, would be something wonderful ; for they are adapted to, and would be used for, all sorts of mechanical purposes. The time is coming when coal will be no longer used in houses; and then, gentlemen, we will begin to live and to take comfort. At the present time half the work in a house is caused by the dust of coal. I took occasion, year before last, at St. Louis, to suggest that, in view of the exorbitant and outrageous prices asked for gas engines, it would be policy for this Association, or for the gas interests of the country, to offer a premium of $10,000 or $20,000 for the best gas engine (the patent to be the property of the Association) and then set somebody to making those gas engines, and sell them at a reasonable profit. There is an engine in London which is just as good as the Otto. It is the Crossley.

Mr. Lansden—There was a committee appointed to report upon that subject. I do not know whether the chairman of the committee is here.

The President—That committee made a report to this effect : that, in consideration of the many demands made by parties for gas engines, there was already incentive enough for inventors to work and apply their skill to the perfecting of a gas engine. No offer of money is needed to incite taem to effort. The committee so believed, and so reported, and were then discharged.

Mr. Brown—I will state why I press that matter. I have the honor to be the President of the National Humane Society of this country. In 1881 we offered (and raised the money for the purpose) $5,000 for the best cattle car, in which cattle could be fed and have room to rest during the transit. The offer was coupled with the condition that the car which we deemed the best should be new and patentable. By that we meant that it should not infringe upon previous patents (because we could not afford to infringe prior patents) and that the successful one, being patentable, should be assigned to us, and by us given free of expense to any railroad company that would use it. Our object in that was to get rid of the objection made by railroads, that they were constantly being pestered with patentees. We advertised that offer, and how many different models do you think were sent to us? Seven hundred and ten? I had a room, nearly as large as this, filled with those models. One was sent by a man who never in his life had seen a railroad car, but he hoped to get the $5,000. The result was that out of the 710 models and plans, there was not one which was new and patentable ; they infringed upon the 111 patents already granted. I spent a year in investigating that matter. We could not give any one the $5,000 ; but you see what the offer brought out. Let the gas companies of this country advertise a reward of $25,000 or $50,000 for the best gas engine, and you will be astonished to see the ideas that will come in, and among them all you will be pretty certain to find some that are good. It will pay you to do it.

Mr. G. A. Hyde (Cleveland, O.)—A man in Cleveland has been working at a gas engine for a year. He thinks that he has got something good, and after a while it will be shown. He has patented the invention, and is now making an engine to be put in operation.

Mr. E. J. King (Jacksonville, Ill.)—If I am not mistaken, some one at the last meeting was going to have an engine out inside of three months ; but nobody has heard from it yet.

Mr. G. A. Burns (Pullman, Ill.)—I am able to give some data as to the relative amount of gas used for lighting and for cooking at the Hotel Florence, at Pullman, during a period of 16 months, as follows :

1882	For Light.	For Fuel.
January	74,600	138,900
February	46,800	104,700
March	52,000	119,300
April	34,600	103,600
May	38,700	133,800
June	31,600	117 900
July	32,300	112,100
August	40,300	113,700
September	53,700	143,100
October	22,500	197,400
November	26,000	194,100
December	162,600	154,100
1883		
January	157,100	179,800
February	119,700	143,900
March	107,800	128,900
April	86,900	161,800

Mr. J. Fullager (Cincinnati, O.)—I have been asked to give our experience in the use of gas stoves in Cincinnati. Two years ago we placed a lot of stoves in houses, free, and allowed them to be used for three or four months. The experiment was very successful. We then started a depot on Fourth street for the sale of stoves. We have, at the present time, 1,500 stoves in use, from the smallest to the largest size of cooking stoves, and have also a great many heaters ; also 117 gas engines, ranging from 3 to 10-horse power. This is an average consumption, by gas stoves and gas engines, of 115,000 feet per day. We have increased our day pressure. We find that very many people (particularly the residents in Walnut Hills and Clifton) are taking out their small stoves, and are putting in the largest size of cooking stoves. In some houses gas is used the entire year through for both cooking and heating. We expect, by this time next year, to have 2,500 or 3,000 cooking stoves in use. If we could have obtained gas engines to meet the demands, we should have at least a hundred more in use at the present time. The trouble is to get the engines. We are hoping that some one else will take hold of the engine business in the country. If there had been more live men in that business we should now have at least 2,000 gas engines in operation in this city.

Mr. George A. Burns, of Pullman, Ill., read the following paper on

THE LOWE WATER GAS WORKS AT PULLMAN, ILLINOIS.

Agreeably to my promise to Mr. Littleton, our worthy Secretary, that I would present a paper at this meeting, I would fraternally submit for your consideration the following, as a portion of what the results have been at the Pullman (Ill.) gas works, from Jan. 1, 1882, to Jan. 1, 1883, and up to May 1, 1883. I also include a slight history of our works from its completion in 1881.

Our works are what are known as the Lowe water gas works. The apparatus and purifiers were furnished by Messrs. A. O. Granger & Co., of Phila., Pa.; the gasholder and oil tank by the Stacey Manufacturing Company, of Cincinnati, Ohio ; and our station meter, photometer, arch pressure gauge, and most of the consumer's meters, by the Goodwin Gas Stove and Meter Company, of Phila., Pa.; the meter prover by Harris, Griffin & Co., of Phila., Pa.

The works were commenced in October, 1880, and were ready to make gas in April, 1881. On the 19th of that month we started the apparatus, the results from which have been in every way satisfactory; so much so that in the summer of 1882 we closed the contract with A. O. Granger & Co. for another and larger generator, superheater (which is virtually the same as the hydraulic main in a coal gas works), boiler, engine, blower, oil distributor, small oil tank for same, gauges, etc. The second set was ready to make gas and was started on Nov. 6 of last year, and has been in constant use ever since.

With our duplicate sets of apparatus we have a capacity, when working both of them, of about 200,000 cubic feet per day, at a very low estimate. The lithograph which I hold in my hand is a very good sectional view of the apparatus, as placed in any works. The first set of apparatus had a generator 50 in. diameter by 10 ft. high ; superheater, 50 in. diameter by 14 ft. high ; washer, 60 in. diameter by 30 in. high ; and 2 scrubbers, 30 in. diameter by 10 ft. high ; all with connections for 8-in. pipes. Our purifiers are 8 ft. in diameter inside ; station meter, 60 by 60 in. With this set we have made, in 24 hours, 65,000 cubic feet, and could have made more did we require it.

The second set of apparatus has a generator 6 ft. diameter by 10 ft. high ; superheater, 5 ft. diameter by 16 ft. high ; washer, 6 ft. diameter by 30 in. high ; with connections for 8-in. pipes. With this set we also had an engine, boiler, blower, oil distributors, small oil tank, gauges, etc.

We connected the new set to the scrubbers we had already in use, placing valves at each washer to shut off either set when not in use. With this second set we have made over 80,000 cubic feet in 24 hours, and could have made more did we need to do so. Having a holder of only 50,000 cubic feet capacity, and having never required but a little over 81,500 cubic feet in one day, we never have made any tests as to how much the larger set would make in 24 hours when run up to the full capacity.

When using the small set, running it well up to its capacity, we had only 2 men to make gas and 1 man (5 hours per day) for the purifiers. When using the larger set we used the same number of men, costing us no more for labor. On a make of 80,000 cubic feet per day this would be about 32,000 cubic feet per man per day.

Commencing with a send-out of about 1,000 cubic feet per day to consumers, we made, from April 19 to May 1, 1881, 44,800 cubic feet, and used, to supply our consumers and blow the air out of our mains, about 41,000 cubic feet, leaving us 3,800 cubic feet in holder May 1st. May, 1881, we made 70,260 cubic feet, and used 48,610 cubic feet, 30,290 cubic feet of which was used to fill the mains in districts not turned on before.

June, 1881, we made	87,070	cu. ft.,	and sent out	84,950	cu. ft.
July, " "	142,020	" "	" "	137,780	"
Aug., " "	133,620	" "	" "	151,290	"
Sept., " "	217,300	" "	" "	198,210	"
Oct., " "	527,960	" "	" "	524,430	"
Nov., " "	845,850	" "	" "	857,280	"
Dec., " "	1,155,960	" "	" "	1,156,670	"
Total for 1881,	3,224,260	cu. ft.		3,197,400	cu. ft.

—leaving us on hand Jan. 1, 1882, 26,860 cubic feet.

Our loss by leakage, condensation, and blowing out of street mains for 1881 was 221,642 cubic feet; being about .068 per cent. of the amount made. The large percentage of loss is due principally to the blowing out of the air from the mains.

At the end of the year 1881 we had 35,395 feet of street mains laid, or almost 7 miles—all cast iron 8-in., 6-in., 4-in., and 3-in. pipes. We had 457 meters set, including sizes varying from 250 to 3 lights. Of the total number 411 were 3-light meters. We also had 106 lamp-posts set, but lighted only 27.

For the year 1882 we have the the following showing:

	Gas Made.		Gas Sent Out.	
January	1,061,490	cu. ft.	1,043,820	cu. ft.
February	711,250	"	708,420	"
March	666,440	"	680,580	"
April	528,360	"	534,720	"
May	591,510	"	567,270	"
June	527,430	"	530,260	"
July	629,070	"	635,430	"
August	804,800	"	799,140	"
September	925,790	"	937,100	"
October	1,334,900	"	1,305,920	"
November	1,620,700	"	1,623,530	"
December	1,942,600	"	1,945,160	"
Total for 1882..	11,344,340	cu. ft.	11,311,350	cu. ft.

Material Used for Making Gas During 1882.

	Hard Coal. Pounds.	Illinois Coal for Boiler. Pounds.	Naphtha. Gallons.	Lime. Bushels.
January..	65,400	100,300	4,552	100
February....	42,900	57,700	3,370	40
March	36,900	44,700	3,233	45
April.....	31,300	36,000	2,589	30
May.....	32,200	23,700	2,772	35
June	26,500	15,355	2,404	40
July	31,500	16,000	2,950	35
August.....	35,500	22,800	3,663	40
September..	37,300	32,400	4,389	63
October	59,100	41,900	6,331	84
November..	68,700	44,500	7,727	119
December ..	77,200	76,600 / 344 18-32 bu. coke	8,508	81
Totals...	546,500	513,955 / 344 18-32 bu. coke	52,488	712

—making for the year, for each 1,000 cubic feet of gas made, 48.2 pounds hard coal, 45.3 pounds Illinois coal, 1.66 lbs. coke, 4.63 gallons naphtha, and 1-18th bushel lime. The cost of the material used, and the exact cost of our gas delivered at burner, I will be pleased to give privately to any member of the Association, having brought the figures with me, and not desiring to include them in this paper, as I consider them "trade secrets."

The large amount of soft coal used was for fuel under our boiler, the steam from which was used to heat the works, keep the holder tank free from ice in winter, and supply our gas fitting department with all that it required for various purposes.

At the end of the year 1882 we had a total of 42,152 feet of mains laid, being a few feet less than 8 miles—none larger than 8 in. diameter. We had a total of 1,129 meters set, varying in size from 250 to 2 light meters. These included 1,024 3-light and 25 2-light meters. We had 219 lamp-posts set, but lighted only 72.

Our loss by leakage, condensation, etc., for 1882 was 102,165 cubic feet, or less than .01 per cent. of the gas made; or, in other words, we accounted for all the gas made during the year but the above amount, and I can charge at least 30,000 cubic feet of that to the breaking of a 4-in. main adjoining a 5-ft. sewer, which settled and broke the main during the rainy weather in April. The rain so saturated our clayey soil that it was almost impossible to find the leak, the gas meantime pouring into the sewer.

For the present year, up to May 1st, we have the following showing:

	Gas Made.		Gas Sent Out.	
January	1,843,150	cu. ft.	1,840,590	cu. ft.
February	1,331,520	"	1,327,990	"
March	1,202,820	"	1,162,530	"
April	1,058,770	"	1,050,990	"
Totals	5,436,260	cu. ft.	5,382,100	cu. ft.

Material Used for Making Gas in 1883 *to May* 1*st.*

	Hard Coal. Pounds.	Illinois Coal for Boiler. Pounds.	Coke. Bushels.	Naphtha. Gallons.	Lime. Bushels.
January..	77,900	97,600	71 28-32	8,429	84
February.	64,950	89,400	.....	6,035	57
March ...	55,600	61,600	.....	5,128	64
April.....	54,300	44,300	.....	4,622	65
Totals.	252,750	292,900	71 28-32	24,214	270

—making, for the four months, for each 1,000 cubic feet of gas made, 0.42 pounds coke, 46.49 pounds hard coal, 53.87 pounds Illinois coal, 1-25th bushel lime, and 4.45 gallons naphtha.

No extensions to our street mains have been made so far this year, leaving us still about 8 miles of the same. At the end of April we had a total of 1,322 meters set, varying in size same as before, showing an increase of 193 meters since July 1st. No lamps have been put up this year, leaving us still 219, of which we are lighting 75. Our loss by leakage and condensation for this year, to May 1st, is nothing; but instead we have a gain of 141,740 cubic feet; or, in other words, we account for 141,740 cubic feet more than we made. The gain in distribution is no doubt caused by our station meter being too small to register the gas made by our large set of apparatus. I have suggested to our company the necessity of increasing that portion of our plant, either by adding another meter or by putting in a larger one in place of the one we now have.

At the first part of every run the gas is made very rapidly, and, unless the meter has a sufficient capacity to allow it to work without running at too high a speed, some of the gas is bound to pass through without registering. We have made as high as 1,000 cubic feet in three minutes, and 2,000 cubic feet in eight minutes, during the greater portion of the runs made. After making about 4,500 cubic feet we stop, and commence blowing up again. We have made as high as 10,000 cubic feet with the large set by blowing up about 45 minutes and running 1 hour, and 8,000 cubic feet by blowing up the same time and running 40 minutes. With the small set we have made 6,200 cubic feet by blowing up 45 minutes and running 1 hour. Our average runs are 4,500 cubic feet with the large apparatus, and 3,000 cubic feet with the small one. We calculate to make a run every 1 hour and 20 minutes, when running steadily. When we have the changes made in the station meter I expect to never make less than 6,000 cubic feet per run with the large apparatus, and 4,000 cubic feet per run with the small one. The candle power of our gas runs from 18 to 22—more often 22 candles than anything else. The test for illuminating power is made by a Goodwin's improved Lowe jet photometer. We have no Bunsen bar photometer, so that I cannot tell what the candle power would be with that; perhaps 2 candles less.

We are introducing gas stoves very successfully, and during last year, besides all the ranges, bake ovens, hot closets, hot plates, heating stoves, etc., in the hotel, we had over 80 stoves in use by consumers that would bake and roast as well as boil. Also a number of boiling stoves. The car shops also use a large number of stoves for heating glue, and use other gas appliances for heating metals, burning off old paint, brazing band saws, heating soldering irons, scorching wood to shade its color for the marqueterie man, etc.

We have a plan for both leasing and selling the stoves. We sell any large stove for $1 per month until paid for, charging cost and 10 per cent. added for the stove; the smaller stoves we sell in one payment. We lease the stoves of all kinds up to No. 10A "Sun Dial" for 50 cents per month; above the 10A we charge a little more. We rent a great many more than we sell.

I have here copies of our "lease" and "lease and sale" of stoves, which the members have the liberty to inspect.

Hoping I have not tired your patience, I will bring this to a close by merely adding that our town is called the "Magic City" by a great many visitors. It was founded by the Pullman Palace Car Company, and named Pullman. The first stake on the survey was driven in March, 1880, and the

first shovelful of earth was thrown out on about the 24th of the following May. The Pullman Company desired to erect large car shops, for the building of all kinds of railroad cars, and in doing that they also built the beautiful city from which I am proud to come to attend this meeting. Those of you who visited our city after our meeting last year know more about it than I can tell you in this paper; but to all of you I would say, do not miss seeing Pullman (and also do not fail to examine the Lowe process) whenever you come in that vicinity. I have with me some photographic views for your inspection.

Discussion.

The President—I would like to ask Mr. Burns one question with regard to the Lowe process: whether the furnishing of coal gas under similar circumstances, and from the same sized works, has come under his observation; if so, how would the price of the Lowe gas, put into the holder, compare with the coal gas?

Mr. Burns—We could make the Lowe gas cheaper.

The President—Can you give us the probable percentage cheaper?

Mr. Burns—I do not know that I can. I have been out of the coal gas business some time.

Mr. G. S. Page (New York)—Can Mr. Burns give us an analysis of the Lowe gas?

Mr. Burns—I will state, for the information of Mr. Page, that I am sorry to say that I am not a chemist, and cannot do it.

Mr. H. Harthan (Selma, Ala.)—Mr. Somerville has had considerable experience in the manufacture of water gas. We would like to hear from him.

Mr. J. Somerville (Indianapolis, Ind.)—I find that my experience is different from that of Mr. Burns; it is that the Lowe gas cannot be made as cheaply as coal gas; and it is not so agreeable to the consumers. They do not like it as well as they do the coal gas. Nor does it burn as well in cooking stoves. I do not know exactly why it should give so much trouble in the stoves; but I have an idea that it takes some of the heavy hyrocarbons along with it from the mains to the heated burners of the stoves, it forms a soot and clogs up the holes.

Mr. Burns—I do not understand how it is that my worthy friend Somerville can go against the Lowe gas, when his company are content to take 60,000 cubic feet per day from the Lowe works and put it into their own holder and sell it for their gas.

Mr. T. G. Lansden (St. Louis)—I think that right here comes the point that I have been fighting for all the time—as to the particular circumstances surrounding particular works. Probably Mr. Burns has never had any experience in manufacturing coal gas in the same quantity as that manufactured by Mr. Somerville. I know that in small works it makes a great deal of difference what the coal gas costs. It is hardly fair to put these two gentlemen against one another unless they are both working upon the same principle. Mr. Burns says that he can make the Lowe gas cheaper than he can make coal gas. I think he ought to tell us about how cheaply he can make coal gas, in order that the comparison may be fair.

Mr. Burns—I am willing to give privately to any member of the Association just what our gas costs delivered at the burner. All the coal gas men here know pretty nearly what their coal gas costs them, and they can then make the comparison. In reply to Mr. Lansden, I will state that on the 9th of May, 1859, I went into the gas works at Rockford, along with Mr. Butterworth. Since that time I have had a great deal of experience in the manufacture of gas. I also spent four years in the Laclede gas works, in St. Louis, Missouri.

Mr. Lansden—Did you ever ascertain the cost of gas at Rockford? And while connected with the Laclede gas works did you ascertain the cost of gas in St. Louis?

Mr. Burns—I did.

Mr. T. Smith (Grand Rapids, Mich.)—Have you ever had any difficulty in the services, in putting in a 1¼-inch pipe?

Mr. Burns—We have never been troubled with that kind of a case—not in putting in services of the kind Mr. Smith speaks of. We did once tap a 6-inch pipe for a 2-inch service, and I told the man to shut the valve on that section; but he failed to do it, and he got the hole drilled and a big supply of gas on hand before he knew it. Other than that, we have never had any trouble in this respect.

Mr. J. H. Woodmansee (Danville, Ill.)—How do you account for the low loss by condensation and leakage?

Mr. Burns—I account for it, in one way, by the fact that our works are new, and our mains are new and well laid. I understand, also, that it is the experience of all Lowe gas men that the loss from condensation and leakage is less than it is with coal gas. Mr. Pearson, of Toronto, read before the American Gas Light Association a paper which treated upon that subject; and he gave the exact amount of saving resulting from the use of the Lowe process.

Mr. Smith—You have cast iron mains, have you not?

Mr. Burns—Yes.

Mr. T. A. Bates (Cairo, Ill.)—In what condition do you find your drips? Do you find any deposit?

Mr. Burns—I can scarcely find any water in the drips except at the inlet of the holder. Once in a while we find a little in the inner drip, and occasionally a little tar drips into the holder. I have my foreman pump the outlet to the drips every morning, and he finds about one pint from the outlet, while in the inlet there is a bucketful, after running all night.

Mr. E. J. King (Jacksonville, Ill.)—I do not think we understand clearly Mr. Somerville's position with regard to the use of the Lowe gas. Are there two works in his town?

Mr. Somerville—We have, in our town, two works—one making coal gas and the other using the Lowe process. The Lowe process company is an opposition company; but I may say that it is a friendly opposition. The works of which I have charge are run up to their full capacity, and I am compelled at times to connect my mains with the mains of the Lowe company, and supply my deficiency from them. I take sometimes as much as 160,000 cubic feet per month from them, and am very glad to get it. They charge me for the amount of gas that goes into the holder. I take it directly from their works into my holder. They send down a bill every month; they charge what it costs them to put it into the holder. That is the way I come to know the cost of gas by the Lowe process. It is not a difficult matter to compare their bills with the cost of coal gas as made by us. That is the reason I take it upon myself to say that they cannot make the Lowe gas cheaper.

Mr. R. T. Coverdale (Rome, Ga.)—I have had a great deal to do with the manufacture of coal gas during the last seven years; and during the last three or four years I have been met at every step by the Lowe process of gas making. I am told that gas can be made much cheaper by the Lowe process than by the use of coal. I have had no opportunity to ascertain correctly just what gas can be made for by that process, but I do know what it can be made for by the coal process. It seems to me we are all open to conviction if we have been mistaken in our judgment as to the Lowe process. If it is a success, we are not only willing to learn so, but we are anxious to know it and to use it. But before we can make up our minds to adopt it we need to be convinced that it is better than the coal gas process. Mr. Burns' paper was very interesting; but it really does not meet my views of the matter. I am as much in the dark now as I was before. Mr. Burns has all his facts and figures here, and I have no doubt they are correct. He tells us that it takes so many pounds of hard coal, so many pounds of soft coal, so many bushels of lime, and so many gallons of naphtha to make 1,000 feet of gas. As Mr. Burns is somewhat interested in the process, and has figured all these things down to a dot, and knows all about it, it strikes me that before he can arrive at a conclusion which warrants him in saying to gas men that we can make gas cheaper by the Lowe proces than from coal, he ought to be able to tell us what it costs him to make just the same quantity of gas from coal, at the same place, and under the same circumstances; and he should be willing to give us the figures. If he will do so I shall feel somewhat relieved, and can then go on and make some calculations as to whether the Lowe process, or some other process, is the best to be used. I do not say anything against the Lowe process; I do not know anything against it; neither do I know anything in its favor. I was interested in the gentleman's remarks; his paper is well written; he seems to know what he is talking about; and therefore I wish he would tell us just exactly what it does cost per thousand feet to deliver the Lowe gas into the holder, and also tell us what it would cost to make the same quantity of coal gas, in the same place and under the same circumstances. If he would only give us the data I would be much better enlightened than I am at present.

Mr. Burns—In answer to Mr. Coverdale, I will say that I did not come here for the purpose of selling the Lowe process. I have no interest whatever in it except as superintendent of the Pullman works. So far as concerns the cost of gas as produced by the Lowe process at those works, I may say that I have shown to many, and am willing to show to any gas man who may visit me at the works, all the books, all the data—down to the fraction of a cent just what the gas has cost. You may take those data home and compare them with your own works. I am willing to give that information to any member of the Association; but I do not wish to state it publicly, for I do not believe in disclosing trade secrets.

Mr. Coverdale—I feel on this subject as I presume every member of this convention feels. That paper was intended to give us some light on the Lowe gas process, so far as Mr. Burns, from his experience, was able to give it. I assumed that he was giving us his candid experience in the use of the process. While that is so, and while we are all trying to get hold of that which is best for the consumer (for what is best for the consumer is best for the producer), still I would like to find out, if I can, the difference in the cost of making gas by the two processes, at places where the manufacture is supposed to be a perfect success. I remember, a few years ago, I was at Put-in-Bay, and Mr. Gaylord, who owned the gas works at Davenport, wanted me to come to Saratoga and see him. He said to me "I want to put

these works at Saratoga into your hands, and I want you to investigate the naphtha process, because I have bargained to buy a portion of the territory for $300,000." There were a number of gas men there, and they thought the oil process was the best thing in the world—that there never was anything like it. They claimed that they could commence to fill a gasholder of 60 feet diameter, from three retorts, at 9 o'clock in the morning, and have it filled by 9 o'clock in the evening, employing for the purpose only two men in the works, and using only five or six gallons of naphtha to do it all. That thing was sold for a million of dollars; and yet you could not find one of those works in operation to-day. That is the reason why I feel that I would like to know a little more about this process; I want to get at the bottom facts; I want to get all the light I possibly can. We cannot make a satisfactory comparison in any other way than by bringing out the data. I know that Mr. Burns could give them all to us if he would; I know that he can, in a very few minutes, from the experience he has had in the manufacture of this gas, tell us just how much it costs. I understood him to say that it does not cost as much to make gas by the Lowe process as it does by the coal process. Am I correct in that?

Mr. Burns—You are correct.

Mr. Coverdale—If you say that it does not cost as much to make gas by the Lowe process as it does by the coal process, I claim that you ought to be able and willing to tell us just exactly what it does cost by the Lowe process. That is what I want to know. If you will tell me what it costs, then I can make up my mind about recommending it. Circulars have been issed and distributed all over the United States, claiming that gas can be made by the Lowe process cheaper than by the coal process. I do not believe that Mr. Burns is trying to deceive us, and I believe that he has the information which we need to enable us to compare results. I do wish, therefore, that he would tell us what the cost of production is by the Lowe process, and also what it is by the coal process at the same works, and under precisely the same circumstances. Give us the result of making gas by the two processes side by side.

Mr. Burns—We have no retorts there, and cannot make the tests side by side. We know what Mr. Pearson, of Toronto, says that it costs.

Mr. Coverdale—What I want is *your* estimate.

Mr. Burns—Mr. Pearson, of Toronto, who has both processes in use, gives the figures. I did not bring any coal gas figures with me, and cannot make the comparison.

Mr. Page—I have listened to the interesting paper of Mr. Burns, but I do not recall any reference in it to the profit from residuals. Do you obtain any residuals by the use of the Lowe process.

Mr. Burns—We do. I am about to put in a tar well to catch them, and will have some to sell to you pretty soon.

Mr. Page—I hardly think that any great value will be found in the tar to be obtained from the Lowe process, because thousands of dollars have been spent in endeavoring to get from it the products which would make the tar valuable. If I may, I will make this additional remark upon the paper which has been read. Perhaps the most important evidence respecting the comparative cost of coal and water gas has been ascertained by a committee of gentlemen consisting of two of the principal directors and shareholders, and the engineer, of one of the most prominent companies in Ohio, who started out a few weeks ago, in the endeavor to obtain reliable data, as to the two processes. They went first to Chicago, and examined the process in operation there—the Springer gas process, which is claimed to be one-half cheaper than the Lowe process for making water gas. They left Chicago, as they said to me, with their knees trembling. They thought that surely they must give up the coal gas business and change their works to suit the Springer process. They visited Baltimore, where coal gas and water gas are made by the same company, as the result of a consolidation between two competing companies. They saw the very inside of gas making as used in those two processes, and became, as they thought, pretty well posted as to the advantages and disadvantages of each. The further East they came the stiffer their backbone got for coal. I will give you their own words, as I have just left them in New York. I took them to the engineer of the largest water gas company in the country. To the man who has made the most water gas of any man in the world, the engineer of the Municipal Gas Light Company of New York City. They stated to him their position, and told him that they intended to introduce the water gas process if it was cheaper and better. They said to him, "We want the opinion of your company. Will you give it to us frankly?" His answer to them was, "You cannot beat coal gas, by any water gas process in the city where you are located." I then took them to the man who is probably the largest builder of water gas works, as well as the largest builder of coal gas works, in the world, and the same statement was made by the committee to him. They said to him, "We want to put in the process which will make gas the cheapest and the best," and stated to him the conditions. His answer was an amusing one. He replied very tersely, "You don't want any water in yours." [Laughter] I then took them to the New York Gas Light Company, where, as you know, they have been making water gas for the last three or four years, having paid $300,000 in cash for a water gas process for the sake of keeping the Municipal Company out of the district from Grand street to the Battery. They were then shown the process of water gas making. The engineer showed them the largest stack of coal retorts in the country, ready to start up on the morrow. "Do you expect to start them up?" "At any time they may be started." The result of these visits and inquiries was that the committee came back satisfied, "We shall not put in any water gas process this year."

Mr. Lansden—We are all here as engineers and superintendents of gas works; we are all endeavoring to do the best we can with the works under our charge. I think it is hardly fair to endeavor to sift from Mr. Burns all his figures with regard to this process unless he has authority from headquarters for giving them. The question resolves itself, in my mind, into this: If there is any process by which gas can be made, all over the country, and especially in the larger works, cheaper by five cents per thousand feet than is now being done, why have not the larger works throughout the country adopted such processes years ago? I speak of it now simply as a business matter, leaving out the question of cost altogether. If water gas can be made cheaper, so as to compete with coal gas, it must come right to the front, like any other invention of acknowledged utility. I believe in giving all the facilities to those who are placed in a position (because of having charge of such works) to give us the information; but it is not quite right for us to insist upon a great many little things being told us, as to which men may have their own business reasons for desiring to conceal, or may be unwilling to speak of publicly. Mr. Burns may make gas for one price in Pullman, and someone in St. Louis may make it for another price. I think that Mr. Rand has made more money out of the water and oil process than any other man who is now running coal gas works. He had an experience of years in that particular line. He is running the coal gas works at Minneapolis, where he has to pay a very large price for coal, on account of his remoteness from the coal fields.

Mr. M. Moran (Joliet, Ill.)—I came here to learn what I could as to the relative merits of the coal and water gas processes. Our company intend to enlarge their works; and if these gentlemen can prove to me what they have said here I will advocate water gas when I go home.

Mr. E. J. King (Jacksonville, Ill.)—I believe it was stated at the last American Association meeting that there was a scheme (originating at Baltimore, I think) by which we were to have gas placed in the holder for 75 cents less than nothing. There are some Baltimore gentlemen here, and I would like to know whether they are ready to report progress on the subject. I believe it was a Baltimore scheme, and it was stated that it was to be tried there inside of three months.

Mr. J. B. Smallwood (Baltimore, Md.)—They have been testing that for the last three months, and are still testing it; but I do not think they have yet come to any decided conclusion.

Mr. Coverdale.—It is all very well for us to talk about water gas and about coal gas. We are here as representing many hundreds of thousands of dollars invested in gas property. I have learned a great deal this afternoon, and I must say that I think we stand in a very ticklish position with regard to water gas; and the sooner we find out whether there is anything in it the better it will be for us, in order that we may take hold of it. I know of several small towns, having populations of 7,000 or 8,000, that are exercised upon the subject of water gas. The people seem to get it into their heads that gas companies are nothing but swindlers, and they seem very glad to seize hold of anything that promises to array itself in opposition to the present companies. In many places the existing companies find that, as their contracts for furnishing gas in the city and for street lighting are expiring, it is a hard matter to get contracts renewed at the old rates. The authorities complain that so much is charged for coal gas, and say they have the promise of water gas to be furnished so much cheaper. I think, therefore, that it behooves us to examine into this matter as fully as we can. It is our duty, acting in the interests of our companies, to investigate it and learn what there is in it. I visited, not long ago, a works where oil gas was being made. They claimed to b making oil gas cheaper than they could make coal gas. They made 4,000 feet of gas from Youghiogheny coal in two benches. I could have made twice as much gas from the coal they used under the retorts, and kept them up as they did; and they also used 8 gallons of naphtha to a thousand feet of gas. And yet they tell you that they can make oil gas cheaper than they can make coal gas. I do not know whether it is so in the Lowe process or not. I think it would be well to look calmly at this thing and see whether there is anything in it. I never before in my life desired so much to learn anything as I do to know just what coal gas would cost Mr. Burns under the same circumstances.

Mr. Burns—If Mr. Coverdale will come over here by me, I will show him the figures; and shall be more than happy to show him through the works, if he will visit Pullman; and will take all manner of pains to show him my books, as well as everything connected with the process. I will take him to the generator room, and he can question the man in charge. He may take

charge and run it for a week, or a month, and he may thus see if he cannot get just the same results as those I have stated. He can see, from the books and invoices, exactly what the coal, lime and naphtha cost us; and I will also show him just what our labor costs. I will give him all the information that he wants. I extend the same invitation to every other member of the Association. I am like the rest of you in wanting to learn just what is the best thing for us to do. I have labored many long days in the gas business. I once went into a tar scrubber, 24 feet high by 6 feet square, and remained in there for eight or ten hours taking out the long slats covered with tar. I have come out from the scrubber covered with tar. There is no necessity for any such work in the Lowe process. Our engine and boiler do the most of the work. After the heat is brought up, the oil runs in of itself, and it makes the gas much easier than we could make it where I have been employed in coal gas works.

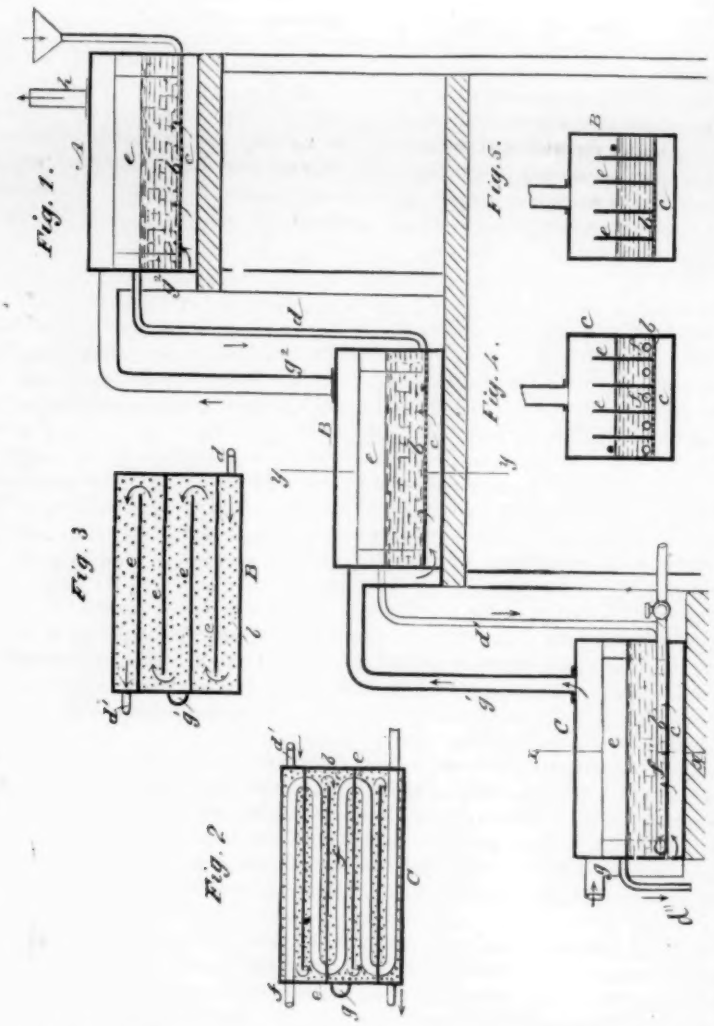
[To be continued.]

Purification by Ammonia.

The principal obstacle in the way of using the impurity ammonia, as a means of removing the other two impurities—sulphuretted hydrogen and carbonic acid—from coal gas, lies in the difficulty of cheaply revivifying the ammoniacal liquor which has been already charged with sulphuretted hydrogen and carbonic acid, so as to enable the same quantity of ammoniacal liquor to be used several times over as a purifying agent.

This successive revivification is necessary, since the quantity of ammonia present in the gas is only about one-fourth part of that required for the removal of the sulphuretted hydrogen and carbonic acid.

There is no advantage gained by using oxide of iron or lime for this purpose, as has been proposed, since it merely removes the impurities from the gas to the final purifying agents by the indirect course of using the ammonia as a go-between.



In the following continuous process the crude ammoniacal liquor is revivified by mechanical means. In this process the liquor is kept in a state of violent agitation by means of a current of air blown through it. This has the effect of driving the whole of the sulphuretted hydrogen from cold liquor. If heated, the sulphuretted hydrogen is eliminated very rapidly, and also much of the carbonic acid. The effect of simply heating foul liquor is to neutralize the affinities existing between the ammonia with carbonic acid, and the ammonia with sulphuretted hydrogen. These impurities, in a great measure, remaining in mechanical solution, the air blast separates that which has been already loosened, and carries forward the sulphuretted hydrogen and part of the carbonic acid, leaving behind the ammonia, which has the greatest affinity for the water.

Figure 1 represents a vertical section of an apparatus adapted to carry out these principles. It consists of three closed iron vessels placed at such a height, one above the other, that the liquor in falling from one tank to the next one beneath will have sufficient head to overcome the pressure of air in the lower one of said tanks.

Each of these tanks *A B C* is provided with a false perforated bottom *b*, and vertical partitions *ee*, arranged to produce a circulation of the liquor between the inlet and outlet, and so produce a fuller and better agitation of the liquor by the air blast. These partitions are seen in plan in figures 2 and 3. Figures 4 and 5 represent vertical transverse sections on the lines *xx* and *yy*, respectively.

Amospheric air is blown, by a steam jet blower or other suitable device, first into the space *c*, by the pipe *g*, between the real and perforated bottom *b* of the vessel *c*, and bubbling through the liquor, ascends by the pipe g^1 to the bottom of tank *B*; bubbling through the liquor here it passes by the pipe g^2 to the bottom of tank *A*, where it again passes through the liquor, finally escaping by the pipe *h*, carrying with it the impurities SH_2 and CO_2.

The crude cold liquor enters the apparatus by the pipe *i* in the highest vessel *A*, and circulates from end to end of *A* as guided by the partitions *ee*; being gradually freed from the impurity sulphuretted hydrogen by the air bubbling through it. The liquor escapes from *A* by the overflow pipe *d* to the lower vessel *B*, where it circulates in the like manner, being still further freed from sulphuretted hydrogen. It then passes by the overflow pipe d^1 to the lowest vessel *C*, where it is heated to any convenient degree by the steam coil *f*. Here the last of the sulphuretted hydrogen is eliminated, and also much of the carbonic acid. Any ammonia carried forward by the air current from the warm liquor in *C* is absorbed by the cold liquor in *B* and *A*.

The liquor then leaves *C* by the overflow pipe d^1 in a purified condition, and may be used in some form of scrubber or washer for purifying the gas. Having done its work in the scrubber it may be pumped into the vessel *A* again, and so used over again as often as required. By using three vessels in place of one, a saving of 50 per cent. is effected in the air supply. If *b* cubic feet of air are required to eliminate the sulphuretted hydrogen from *c* gallons of cold liquor, then, when three vessels, each containing *c* gallons, are arranged so that the air passes from one to the other in succession, the quantity of air required to eliminate the sulphuretted hydrogen from the whole is not $3b$, but $\frac{3b}{2}$.

The apparatus has not been tried on a large scale, and hence no figures can be given as to the actual working of the process. As an attempt at the solution of the problem of purification in closed vessels, the process has no doubt some interest, the principles on which it is based being facts founded on actual experiment. It is the invention of J. Taylor, of Halifax, N. S.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Death of Mr. G. A. Perdicans.—On the 8th of April last, Mr. G. A. Perdicans, one of the oldest members of the fraternity in this country, being 84 years of age, died at the residence of his son, Ion H. Perdicans, at Tangiers, Morocco, whither he had gone in search of health, which had been gradually failing for the past seven or eight years. As far back as 1840, Mr. Perdicans was one of the few men who believed at that time that the gas business of this country had a great future before it, and, acting on his judgment, himself and associates commenced the construction of gas works under the firm name of G. A. Perdicans & Co. His associates were James Hoy, James C. Potts and Van Cleve, and McLean, all of Trenton N. J. This firm built works at Pottsville, Pa.; Alexandria and Peterburg, Va.; Augusta, Ga.; and at other points in the South. This firm was dissolved, and a new one formed, with the title of Perdicans & Hoy. For many years this last concern operated very extensively. They erected works at Lynchburg, Charlottesville, and Portsmouth, Va.; Wilmington, N. C.; Charleston, S. C.; Macon and Columbus, Ga.; Natchez, Miss.; St. Paul, Minnesota; Cumberland, Md.; San Francisco, Cal.; Princeton, Orange, and the Citizens Company, of Newark, N. J.; and the Metropolitan Company of New York City. Besides being actively engaged in the prosecution of these various extensive and widely-separated operations, Mr. Perdicans was interested as a stockholder in a number of other companies.

Mr. Perdicans was a gentleman of great attainments as a scholar, and as he also possessed unusual far-seeing business qualities, together with a pleasant urbanity of manner, his career was more than ordinarily successful. Before going into the gas business Mr. Perdicans was a Professor at Harvard

and Columbia (S. C.) colleges, and, for several years, was United States Consul at Greece. While teaching at Columbia he became acquainted with his talented and estimable wife, who survives him. For the facts given above we wish to acknowledge our indebtedness to Mr. John McIlhenny, of Philadelphia, Pa.

New Gas Plant.—Mr. C. E. Gray, of St. Louis, Mo., has contracted to erect works at Duluth and Fergus Falls, Minn. The new establishments are to be operated under the Springer patents. The Stacey Manufacturing Co. are to erect the holders, which are to be covered, and of the dimensions of 50 by 18 feet.

Enlarging the Charlotte (N. C.) Gas Works.—The Charlotte Gas Light Company is making extensive alterations to its plant. A new holder, 50 by 16 feet, with five cast iron columns, has been ordered from the Stacey Manufacturing Company.

Bloomington (Ill.) to be Blessed (?) with an Opposition Company.—Mast, Foos & Co., of Springfield, Ohio, are said to be furnishing the capital to the Citizens Gas Light and Heating Company, a concern which has obtained the right to build works, and lay mains for the purpose of supplying gas to the inhabitants of Bloomington, Ill. Mr. G. A. Burns, formerly of Pullman, Ill., is in charge of the construction. The price charged for gas by the old Bloomington company is $2.00 per thousand.

Explosion at the Fort Wayne (Ind.) Gas Works.—At an early hour on the morning of May 30, a serious explosion of gas occurred in the meter room of the Fort Wayne Gas Light Company. Mr. John Wort, the general forman, and an employee named W. J. Luhrman, received serious injuries. The works are owned by Judge Cheney, of New York City, prominent from his connection with the management of the Wabash Railroad. The loss occasioned by the explosion will amount to about $1,000. The company has been in operation for 26 years, and this is the first accident it has met with.

How Mr. Butterworth, of Rockford (Ill.) Managed it.—Mr. Thos. Butterworth, of Rockford (Ill.) writes us as follows:

"In your Journal of May 16, you saw fit to publish a little circular on gas stoves, which was gotten up by us for distribution in our city. Your so doing has brought me, from all parts of the country, many letters inquiring as to our methods of introducing and selling gas stoves; and, with your permission, I will answer these inquiries through the Journal, since, by so doing, I can reach all at the same time by one writing.

"In the first place—some three years ago we commenced setting up gas stoves at cost, with expense of placing and freight added. This plan did not work satisfactorily, as we only disposed of seven stoves on these terms. Our next step was to advertise that for 60 days, we would set up, free of cost, any make of gas stoves (including separate meters when asked for,) we having all description of stoves in stock. The conditions we made were that parties wishing to try cooking by gas should pay, in advance, and use in the stoves so set up, for a certain amount of gas, the quantity paid for to be in proportion to the size and cost of the stove employed. If a stove cost $25.00 net, we required $75.00 cash down, giving the purchaser a receipt in full for so much gas at our regular prices, viz., $2.37½ per thousand, net. Other sizes of stoves we furnished at the same ratio; say, three times the net prices of any stove to be paid in advance, the money so received to be applied to the consumer's gas account, and no charge being made for the stove proper. This scheme worked so well that over 25 per cent. of our consumers now have gas cooking stoves.

"Some of my friends will say, you ought to be successful; anybody can give stoves away. Well; sit down and figure it out. You will find that, from the money so paid in advance, after taking off the net cost of stoves, we got from $1.60 to $1.85 per thousand for the gas used for cooking purposes, and we also established afterwards a permanent summer consumption at full rates, as we made no further concession from our regular price, let the gas be used for whatever purpose it might. The increased sale of gas was such that the 60 days arrangement has been continued permanently; and we feel that we are justified in doing this, since we have already increased what I might term our six summer months consumption by over 500,000 cubic feet. And this increased output has been obtained by the expenditure of less money than could be secured by the investment of a much greater sum in any other direction. This will be readily understood when I say that, in our town, it would be impossible to derive two per cent. per annum on the cost of any further extension of our mains.

"Our experience with gas heating stoves has not been so satisfactory, and we have no gas engines in town. We keep in stock, ready for setting up, any and all makes of gas cookers. This will reply to about all the questions asked in the different letters received by me so far, and alluded to above."

An Injunction Dissolved.—E. Ellery Anderson sued the Equitable Gas Light Company, of New York City, and Hurbert O. Thompson, Commissioner of Public Works, in the Court of Common Pleas recently, and secured a temporary injunction restraining the said company from laying its pipes or mains on First avenue, and enjoining Commissioner Thompson from granting the company permission to proceed with its construction. Judge J. F. Daly has dissolved the injunction, holding that by an act passed by the Legislature in 1848 permission was granted to all lawfully incorporated gas light companies to lay pipes through any and all of the streets of this city.

Narrowly Escaping Death from Suffocation.—Frank Jusco, an Italian, twenty-five years of age, a guest at Hartman's Hotel, No. 47 Bowery, N. Y. City, was found unconscious in his room on the morning of June 5, suffering from the effects of inhaling illuminating gas. He was resuscitated by the ambulance surgeon, and was not removed from the hotel. Tusco, on retiring the night before, had blown out the gas.

"Gobbled" by the Standard.—At the annual meeting of the stockholders of the Williamsburg Gas Light Company, held at the office of the company, No. 157 Fourth street, Brooklyn, N. Y., on Monday, June 4, Messrs. William Rockefeller, Henry E. C. Benedict, George G. Lake, James S. Bearns, Robert Willets and John T. Willets were elected as Directors for the ensuing year.

Extensions at the Toledo (Ohio) Works.—After a thorough examination of the merits of various patent processes, a committee representing the Toledo (Ohio) Gas Light Company, and composed of Messrs. Backus and Berdan, of the Board of Directors, and Charles R. Faben, Superintendent, decided to double the capicity of their existing coal gas plant. The contracts for furnishing the machinery have been awarded to the Smith & Sayre Manufacturing Company. The Toledo company also decided to erect a "Standard" washer-scrubber.

Street Lighting in Detroit, Michigan.—The citizens of Detroit are beginning to think that it is about time that the principle of consulting the phases of the "pale moon" in relation to lighting the streets of their city should be discarded. The same citizens also object to the sickly splutter and the ghostly glare of the giddy gasoline. At the meeting of the Common Council held Tuesday, May 29, the Committee on Gas reported on the proposals for lighting the street of the city and public buildings, and recommended that hereafter all the street lamps should be lighted from one-half hour after sunset until one hour before sunrise on each night. The committee reported that the contract for lighting the gas lamps in the eastern part of the city be awarded to the Mutual Gas Light Company, and those in the western section be given to the Detroit Company. The committee further recommended that the proposals for lighting the naphtha lamps be rejected.

State Gas Inspector Hinman to go to Wimbledon.—The irrepressible "gas man" crops out everywhere, and now we are to have one of the fraternity as a member of the team which is to represent the United States Military Service in the international competition before the Wimbledon "butts." Mr. Charles W. Hinman, the Massachusetts State Inspector of gas and meters, is the man, and if he proves to be as expert in the use of the rifle as he has hitherto shown himself in the handling of gas meters, his brother gas men will have reason to be proud of him. In the preliminary practice at Creedmoor Mr. Hinman proved himself an adept at finding the bull's-eye, he having, during the three trial days, been credited with 513 points out of a possible total of 630, and was third on the list out of the first eight. He comes to the team as a representative of Company "D," First Massachusetts Volunteers.

United States Electric Light Company.—On June 5, the Board of Directors of the United States Electric Light Company, of New York City, met and elected as officers for the ensuing year, Messrs. G. W. Hebard, president; S. E. Curtis, secretary; and F. Kobbe, treasurer.

The Edison System in New York City.—The eighteenth bulletin published by the Edison Electric Light Company, states that the company is now supplying from the Pearl street station, the current for lighting 429 separate buildings wired for 10,268 lamps. It is a somewhat singular feature that all the new connections are being made in the vicinity of Wall, Broad, and Nassau streets, Exchange Place, etc., or in the immediate district which comprises the great money center. It is a fact that the occupants of a number of buildings which were wired for this light some months ago, and not in the immediate neighborhood of the money market, have never been able to get the final connections made in order that a trial of the light might be secured.

No Edison Light in the Western Union Telegraph Company's Building.—Some time since it was officially stated that the main offices and building of the Western Union Company, 195 Broadway, New York City, were to be lighted with the Edison incandescence lamps, the current for the

same to be supplied from the Pearl street station of the Edison Company. While such a determination had been arrived at—and, in fact, a written contract was actually drawn up looking to that end—it has since been concluded by mutual consent of both contracting parties, to annul the arrangement previously entered into, and the building is at present, and will be in the future, lighted by gas.

Fires in Massachusetts Gas Works in 1882.—It is quite a striking thing to note the comparative immunity from loss by fire which is enjoyed by the gas interest throughout the country. In no other portion of the United States can we look for a better illustration of this fact than by turning to the twenty-eighth annual report of the Massachusetts Insurance Department, just published. When it is considered that there are 65 gas light companies operated in that State, and, in round numbers, about $20,000,000 invested in the business, it is as ludicrous as it is astonishing to find that during the year 1882 there were but three fires which took place in gas works proper, and that the total loss occasioned by such amounted to just $80.

Ignition and Non-Ventilation in Drying Rooms.—The *American Exchange and Review* says that a somewhat curious instance of ignition, illustrating unanticipated, unknown, or mistaken cause of fire in factories, occurred in Philadelphia about twelve years ago, in a cotton and woolen mill of moderate size. Fire outbreaks occurred almost monthly in the drying house, which had a number of stories, with floors composed of wooden slats supported on wooden joists. Heating was furnished by the waste heat from the plain cylinder boilers and flues, but no arrangements whatever had been made to ventilate the rooms. After quite a number of small fires had occurred and been extinguished with small damage, in some cases no claim being made upon the insurance companies, the companies, by advice of their inspectors, concluded that the fires arose from want of proper ventilation, and so notified the owners. Practical men did not agree with the insurance theorists, and further declared that the admission of a current of cooling air in the rooms would prevent the material (raw dyed cotton, wool, and cotton yarns) from drying properly; and so the ventilation continued to be neglected, and other ignitions occurred. Finally the insurance companies notified the manufacturers that if the ventilation was not made, and another fire happened, they would cancel all their policies on the whole establishment. Ventilation was thereby forced, and it is stated that thenceforth the fires ceased entirely in that drying house.

Price of Gas Reduced in Washington, D. C.—The Washington Gas Light Company, of Washington, D. C., has notified its consumers that on and after July 1, the price of gas for private consumption shall be $1.50 a thousand; and that the gas supplied to public lamps shall be $1.05 per thousand. The surest and best method of obtaining cheap gas will soon be found out by the "dear people," and they will speedily become convinced that the surest and best method is *not* by giving corporate life to opposition companies. The United States Gas and Fuel Company, which floated to the surface so complacently last winter, and which became waterlogged so speedily, may be dead, or it may be "only sleeping;" but should a future attempt be made to galvanize its now placid form, we think that the reduction just announced by the old Washington company will exert upon it the same effect that a six-barred hurdle very often does to a tired, and heavily-handicapped steeplechaser.

The McIlhenny Recuperative System.—The admirable system of heating benches, devised and patented by Mr. George A. McIlhenny, engineer of the Washington (D. C.) Gas Light Company, an illustration of which was published in this Journal, in issue of January 2, 1882, is being introduced by the Chicago Gas Light Company into its works. Eighteen benches of "sixes" are now being erected and fitted up under this system.

Something to Guess at.—There was quite an interesting meeting held on June 7, at Atlanta, Ga., and the newspaper men of that city are very much annoyed at their failure to find out what was done. We do not propose to enlighten them here, thinking that it would be just as well to let the aforesaid newspaper men, as well as some other folks, exercise their wits a little, and, for the time being, enact the role of guessers.

The time for announcing the object and events of the meeting has not yet arrived, but it may be safely premised that the following named gentlemen did not meet together exactly for pleasure: The parties present were Messrs. J. Gilmer and A. G. Guerard of Savannah, Ga.; Thomas Turner, Charleston, S. C.; A. E. Boardman, Macon, Ga.; Amory Dexter, Columbus, Ga.; E. Fowler, Montgomery, Ala.; T. G. Healey and William Helme, Atlanta, Ga.; Samuel Prichitt, Nashville, Tenn.; and J. A. Caldwell, of Chattanooga, Tenn. The sickness of President Dr. Dugas, and the absence of G. S. Hookey from town, prevented the Augusta, Ga., company from being represented, although both these gentlemen are in entire accord and sympathy with the objects of the gathering. The meeting was entirely and satisfactorily successful, and when things shall be completed our readers will learn more about what was done, and what it is intended to do.

Well, Here is a Common Council!—The Wilmington (Ohio) Common Councilmen held a meeting a short time ago; the subject for consideration was the renewal of the contract with the Wilmington Gas Light Company for lighting the street lamps. A motion to suspend the rules was carried, and the motion to authorize the authorities to accept the gas company's bid for lighting the street lamps was adopted without a dissenting voice. Contrast this action with that of the Brooklyn Board of Aldermen, which thanks to the powers that be, has been legislated out of existence, the date to be inscribed on their tombs being December 31, 1883; and we say, "Let them R. I. P."

The Wilmington contract covers a period of 10 years, and is to date from the 1st of November. The price is $30 per lamp per annum. This same company has reduced the price of gas to private consumers, as follows: For a consumption of 1,000 feet, and less, $2.75; over 1,000 feet, $2.50. A further discount, from these figures, of 25 cents per 1,000 is allowed on all bills paid by the 5th of each month, virtually making the prices $2.50 and $2.25. The old prices were $3 and $2.75. Bill are presented on the 1st day of the month. Eighteen candle gas is supplied, and the consumers and gas company are established in mutually pleasant relations. Why cannot this be the case everywhere?

Portland (Maine) Gas Contracts.—The contract for lighting the street lamps and furnishing gas to public buildings in Portland (Me.) for the ensuing year has just been entered into. The price agreed upon is $1.85 per thousand for gas supplied to street lamps, and $2.25 per thousand for that used in the public buildings. The lamp-posts are to be equipped with meters.

San Francisco to Light its Streets in July.—There is light ahead for the citizens of San Francisco, Cal. July has been fixed upon as the time for relighting the streets.

Uniforming Philadelphia Gas Trust Employees.—The employees of the Philadelphia (Pa.) Gas Trust, who have occasion, in the performance of their duties, to visit dwelling-houses and other buildings, are to be uniformed. The suit recommended is to be of dark blue, with brass buttons having the letters P. G. W. upon them. In the winter a navy cap is to be worn, and in the summer a dark straw hat. Upon the front will be a badge inscribed "Philadelphia Gas Works."

The Edison Lights Went Out.—During the trial trip of the steamer Pilgrim, on Tuesday, June 12, the Edison lights, with which the vessel is equipped, went out, at the very time when most needed. The extinction occured while the guests were at dinner, and the dining-room, which is below the main deck, was left in darkness for about half an hour.

Death of President Jones, of the Easton (Pa.) Gas Light Company.—Mr. M. H. Jones, one of Easton's prominent lawyers, and president of the Easton (Pa.) Gas Light Company, since its formation in 1851, died on Friday, June 1, in the 72nd year of his age. He was born at Coventry, (Conn.) and graduated from Rutgers College, New Brunswick (N. J.) in 1830. He was a trustee of Layfayette College, and was a man of liberal culture, and highly esteemed by all who knew him.

Correspondence

[The Journal is not responsible for the opinions expressed by correspondents.]

Mr. Fullager Makes a Correction.

Gas Works,
Cincinnati, Ohio, June 5.

To the Editor American Gas Light Journal:

In perusing the last issue of the Journal (June 2) I perceive that in the report of discussion following the reading of Mr. T. G. Lansden's paper on "Benches," you have me reported as making the following statements, to wit—

"Mr. Fullager—I have tested the Keystone coal pretty well, but could get nothing out of it. I have used it under both low and high heats, and could only get 9¼ to 10 candle power."

Now, the foregoing is wrong. What I did state is as follows: Mr. Lansden, in his paper, said that he obtained 5.25 cubic feet of 17.82 candle gas from the aforesaid coal. In discussion I said that I never obtained from that coal, with such a yield, (5.25 cubic feet) more than from 9½ to 10 candle gas. This materially changes the sense of the statement credited to me in your report. I deem it proper to call your attention to this matter, as the statement attributed to me would lead any person reading the report to infer that the Keystone is a very inferior coal; and this is contrary to the facts, as I consider it one of the very best gas coals in the market. Yours truly,

J. Fullager, Supt.

[Official Report.]

Fourth Annual Meeting of the Central New York Gas Engineers' Association.

Held at Bradford, Pa., May 23 and 24.

In response to an invitation extended by the President of the Central New York Association, a delegation from the New England Gas Engineers' Association left Boston Monday evening, May 21st, bound for Bradford. The New Englanders had been invited by Supt. A. C. Wood, of the Syracuse gas works, to *tar*-ry with him for a day, and view some of the wonders and beauties of the "Salt City." The party included the following members and friends of the New England Association:

J. P. Harbison, Vice-Pres., Hartford, Conn.; G. B. Neal, Secy., Boston, Mass.; F. Butrick, Waltham, Mass.; F. J. Davis, Boston, Mass.; Zenas Parmenter, Waltham, Mass.; W. D. Cadwell, Nashua, N. H.; A. M. Norton, Mayor of Nashua; John Andrew, Chelsea, Mass.; G. D. Bill, Malden, Mass.; H. F. Coggshall, Fitchburg, Mass.; H. B. Leach, Taunton, Mass.; G. C. Fry, Lynn, Mass; J. H. Rollins, Worcester, Mass.; Wm. Tarbell, Waltham, Mass.; Isaac R. Scott, Utica, N. Y., formerly of Waltham, Mass.

Arriving at Syracuse, reinforcements appeared in the persons of H. E. Floyd and N. R. O'Connor, of New York, and Wm. McDonald, of Albany, N. Y. After breakfast at the Globe Hotel, all repaired to the gas works, where an hour was spent in inspection and comparison of notes. Then carriages were announced for a trip to the solar salt fields, and the New York Mills, where the methods of sinking the wells, pumping the brine, evaporating by solar and artificial heat, purifying, grinding, and packing the different grades of salt were all clearly shown and explained. Doubts as to the strength of the brine on the part of the members from "down East" were quickly *cured* by sampling, and, thoroughly salted, the pilgrims journeyed on.

Just at noon the procession reached the office of the gas company, where a lunch was in waiting, and the almost unendurable thirst arising from the too copious draughts of salt water was quenched with coal-tar, extra-dry ammoniacal liquor and cold tea.

After lunch, to horse once more, and the remainder of the afternoon was spent in riding about the city. Favorable comments from the visitors on the beauty of the streets, dwellings, and changing views, as seen from James street and University Hill, were frequent, and the day was finally brought to a close by a dinner at the Globe, served in host Dickinson's best style. Wit and wisdom followed until train time. Rochester was reached at ten P. M., and here the night was passed.

Early Wednesday morning, accompanied by General Freight Manager Sawyer, the expectant crowd took a special car kindly furnished by the Rochester and Pittsburgh R. R. Co., and were whirled away through the lovely Wyoming Valley, past the prospective city of Warsaw, with its newly discovered underlying beds of rock salt, one hundred or more feet thick, into the pipe, tank and derrick covered mountains and valleys of the oil district. Long trains of gas coal bound for central and northern New York and the East, pass us on the way, and show that the road is destined to become an important factor in determining the cost of coal in the sections reached by it and connecting roads.

Bradford! All out! and we find all the officers, managers and entire board of directors of the Bradford Gas Light and Heating Company drawn up in solid front awaiting us with outstretched hands. As several expected members of the Central New York Association had not yet arrived, it was deemed best to postpone the business meeting until evening; and the afternoon was occupied in visiting the Oil Exchange, the Robert's Torpedo establishment, office of the United Pipe Lines, and other points of interest in the city. At eight P. M. the Association met in Pompelon Hall, President McDougall in the chair. In the absence of Secretary White, the president appointed W. A. Wood, of Syracuse, secretary *pro tem.* The following members responded to the roll call:

Pres. John McDougall	Hornellsville, N. Y.
C. E. Hequembourg	Dunkirk, "
A. C. Wood	Syracuse, "
L. C. North	Canandaigua, "
A. T. Avery	Dunkirk, "
M. Harrington	Niagara Falls, "
Geo. Rider	Norwich, "
Fred Palmer	Brockport, "
W. A. Wood	Syracuse, "

The secretary announced that the minutes of the last meeting had not been forwarded by Secretary White, and as the report of that meeting had not been published the reading must necessarily be omitted.

The names of E. C. Perry, Dunkirk, N. Y., Wm. McDonald, Albany, N. Y., and Dr. J. T. Williams, Dunkirk, N. Y., were proposed for membership. On motion of Mr. Palmer, of Brockport, which was carried, the secretary was instructed to cast the ballot for the Association, and the gentlemen named were declared elected.

President McDougall in a brief speech welcomed the Association to Bradford. It gave him great pleasure to note the presence of the New England delegation and without the formality of a motion he extended the privileges of the floor and invited their participation in the discussions.

The secretary read letters of regret from absent members of the two associations, W. H. White, secretary of the American Association, and members of the New York Society of Gas Lighting.

A communication from Jas. Crutchett, New York, introducing a pamphlet entitled "National Gas and Food Reform," was received and ordered placed on file.

A letter was read from Mr. Geo. Shepard Page, written from St. Joseph, Mo. Mr. Page had previously notified the president that he would be present with a paper on "Ammonia," and would also exhibit the new Bower-Grimston burner in operation. Of the latter he writes: "It is exceedingly "powerful, perfectly steady, converting sixteen candle gas into thirty (30) "candle. The ten (10) foot burner I have with me has been burning for "three nights in the front window of the Mutual Gas Company here. A crowd "was gathered and most of the spectators thought it was an electric light "made steady. They readily accepted the statement that it was a recently "invented combination of gas and electricity, that would entirely supplant "the electric light!"

Mr. C. E. Hequembourg gave a short address on the natural gas supply and the methods adopted by the Bradford Company in supplying the city.

When the company first took hold of the project the gas was wasted in immense quantities. The nature of the wells was not then as well understood, and the company have learned by experience that a difference is found when what are known as the first, second, and third sand rocks are penetrated. It was supposed that the supply was comparatively unlimited, and would last for a number of years. Connections were made in a loose manner. The delivery pipes of large size were run into stoves and under boilers. The pressure at the well soon dropped to 125 lbs. and the result threatened to be disastrous. In fact, after the first winter the pressure at the office did not at times exceed two-tenths water pressure, and it became a question with the consumer which way the gas was going. The combustion was imperfect, and half-burned gas could be tasted all over town.

To check the failing supply the character of the business was radically changed. Bulb, or atmospheric, burners were introduced, and their use insisted on wherever the gas was employed for fuel; the pressure was controlled, and a benefit resulted immediately: but the supply still decreasing, the wells were sunk to the third sand rock, and finally pumping was resorted to. The gas has not been tested, but probably ranges from ten to twelve candle power. No purification is required. A small holder is used, which acts simply as a governor. The rates charged being fixed, there is no check on the amount burned, but estimating the commercial value from the amount sent out the gas is probably furnished for about six cents per thousand. It certainly has never exceeded ten cents. The supply, first drawn from one well, is now obtained from several, the company controlling in the neighborhood of thirty (30). This plan is essential, as the progress of the gas through the sand to the wells is slow and the supply is variable.

Mr. Harbison—Is the gas furnished through meters?

Mr. Hequembourg—The gas is not measured to the consumer. The rates are determined by the quantity that *could* pass if all openings were in use

Mr. McDonald—What pressure do you carry on the mains?

Mr. H.—Four inches water pressure. The pipes are small for the amount of business, and the same pressure is carried summer and winter.

Mr. Harrington moved a vote of thanks to Mr. Hequembourg for his interesting statement. Carried unanimously.

Mr. A. C. Wood, Syracuse, N. Y., read the following paper on

The Present Condition of the Coal Gas Interest in its Relation to other Processes and the Electric Light.

It was not my intention to present a formal paper for your consideration at this meeting, but only to jot down the few remarks I intended to make in order that the several positions I should assume would be clearly defined; but the subject matter I propose to speak of has so enlarged on my hands that I have concluded to read from memorandum prepared.

At the outset, allow me to say that we can congratulate ourselves on the present prosperity and bright prospects of our business, for, from reports from all directions, there never was a time in the history of gas making when the interests we represent were in better condition or the prospects brighter than at present. The only competitor we have or are liable to have is oil. While here at Bradford, in the very center of the oil operations, we have seen the oil brought forth from the various valleys, from every hill top and mountain side, and have learned of the millions of gallons produced; the very ground we tread upon, the air we breathe, and the talk of these fifteen thousand people, all seem to be saturated and filled with oil. Yet with these facts and statistics before us we feel well assured that it cannot be placed on the market in a merchantable and suitable condition at a less price than that at which it has been sold in years past. At these prices we can in most localities compete with it light for light, after taking into account the attending expense. In doing this we must use our best endeavors, by strict economy and the adoption of improved apparatus, to get the best results to be obtained in our own operations, and sell gas to consumers at the lowest price consistent with paying a fair return to our stockholders. Encourage the consumers to use gas, not only for light, but for cooking, heat, and power; and teach them how to use it economically.

The uses which gas can be put to, and in an economical way, are many and various. We have in a tin shop several gas furnaces used for heating soldering irons, which show a great saving over charcoal. These furnaces are in constant use ten hours each day, and with gas at $2.00 per thousand, are run with less expense than with charcoal at fifteen cents per bushel. Then, too, the men turn out more and better work with the gas fires. These furnaces have been run for eight months and have consumed about one hundred thousand cubic feet of gas in that time. This is but one of the many mechanical purposes for which gas can be used to advantage; and if this branch of the business is not worked up to its full extent, it is largely the fault of those in charge. If proper attention is paid to this it will be found to largely increase your sales, thus enabling you to sell gas at a lower price and more successfully compete with oil.

In the management and operation of your works I cannot but recommend that you adhere to the manufacture of coal gas. From personal observations and other means of information of the merits of the various so-called 'new processes' of making gas from oil, water, wood, etc., I have yet to find that they show any advantage over coal gas either in cost or quality of the gas manufactured. These personal observations have extended over many years, and the various new processes which are brought out from time to time are but slight variations or manipulations of the material used, and the gases made but a change in name of those which have preceded them.

The difference in the cost of the gas will at best vary but a few cents per thousand; and this variation is caused by the variation in cost of the raw material and labor in different localities, and the efficiency with which the works have been conducted. As we are situated for obtaining material we have always been able to show that we could make coal gas at less cost than was claimed for the new process. Even with the present low price of oil coal gas can be put in the holder at the least expense, and when the royalty is added, for these new processes are all patented, it places the cost far above that of coal gas. Do not be deceived by the claims of these parties as to the low cost at which they can manufacture gas, for if you do, you will surely be taken in. Their statements are well calculated to deceive, and only cover the cost of labor and material to put the gas in the holder; and this cost, either in quantity or price of material required, and labor to be performed, is given far short of what is actually needed. An investigation will show you that this is almost always the case.

A few months ago the agent for a patent gas process called on me to present his claims and sell his patent, claiming to be able to make gas by his process at one-half the cost of coal gas, stating that from one cord of wood costing five dollars he could make 60,000 cubic feet of gas, and that it required only four (4) gallons of oil for each 600 feet and one-half pound of coal for fuel for each one hundred feet of gas made. A fair statement on its face, but one calculated to deceive those not informed in these matters. The impression made was that the five dollars for the cord of wood and a few cents for oil and coal was all the expense entailed for material for the 60,000 feet of gas. Now, let us see what the actual cost from this statement would be.

One cord of wood to 60,000 feet	$5 00
4 gallons oil to each 600 feet—400 gallons for 60,000 feet, 400 " at 4½ cents	18 00
½ lb. coal to each 100 feet—300 lbs. for 60,000 feet, 300 lbs. at $4.50 per ton	67½
Total cost of material for 60,000 feet of gas	$23 67½
" " " per thousand	.394

It was allowed that there was no charcoal or other residuals of value remaining. It was claimed that gas by this process would cost but one-half as much as coal gas. Now, if the gentlemen present are making coal gas at double the above cost for material alone, they ought to shut up shop and go West. Look closely at the claims and statements of these patent process men and you will find that they can show you no advantage. Again, the uniform quality and chemical constituents of coal gas are beyond doubt superior to all others. I can say without egotism that the coal gas men of the country are smart, intelligent and better informed on gas matters with their years of experience than are these patent process men who come up like mushrooms, exist for a time, and then pass away.

They have so far succeeded in introducing their processes in a few of the gas works of the country, mostly those of small capacity. A recently published directory of the gas light companies of the United States and Canada shows a total number of eight hundred and eighteen (818). Of these 708 report the kind of gas manufactured. 78 $\frac{5}{10}$ per cent. of these report coal gas, the balance are divided among the different processes known. Competent authorities inform us that only about one per cent. of the gas made in the United States is the so-called 'water gas.' Another significant fact is that the average price charged by the above companies is for coal gas, $2.70 per thousand, and for all kinds of patent gas, $3.82 per thousand. The patent process men say that the coal gas men are conservative, and prejudiced against their processes. We are conservative in the interest of our respective companies, and prejudiced against those schemes that promise nothing to our advantage after a full and careful investigation of the matter. The patent gas men having only the experience of working their own individual processes, and only their individual interests to serve in getting as much money for their worthless patents as is possible out of the existing companies, have succeeded after many years of effort in introducing their processes into some one hundred and fifty different gas works, and this has generally been done by building opposition works, or threatening to do so. The fallacy of their pretenses for cheap gas is shown by the foregoing comparison of prices at which gas is sold, also from the significant fact that as soon as a compromise has been effected, which always follows competition wherever opposition is established, the price of gas always advances, and above the promised price for cheap gas. This is also the case whenever they obtain control by purchase or otherwise of a city or district. The price of gas is advanced and above that previously charged for coal gas. A notable example of this is the recent advance of fifty cents per thousand in price in the district now controlled by water gas men in the City of Brooklyn.

The attempts of these men to laugh away and deride the poisonous nature of carbonic oxide will prove abortive. This point was well taken care of by President Slater in his admirable address to the N. E. Association in February. Whenever they shall have proved that carbonic oxide is harmless to humanity, then will the French lovers, and others of suicidal intent, be obliged to secure some other means for accomplishing their purpose than a pan of burning charcoal.

Heretofore the patent gas men or companies have operated independently. Not succeeding in their schemes, they have combined for a war on established companies; and from demands already made we are able to comprehend their purposes and intentions. We learn that they are not at all modest in their demands, requiring the established company to either relinquish their property by lease or sale, or to pay a large sum of money. Failing this, opposition works will be established.

They claim to have the means and power to enforce one or more of these conditions. They also allow that they have no sympathy with or for gas consumers, private or municipal. It is money which they are after. Truly a fine condition of affairs! It should be met by the gas companies of the country in a combined effort against it. The Western Gas Light Association, at its meeting in Cincinnati the present month, took the initiatory steps in this important matter, and I will call your attention to their action; also to the advice of President Slater in his annual address to the members of the N. E. Association in February last, in which he advises the members to bring this matter to the attention of the officers of their respective companies, also to the authorities and citizens of their respective places of residence, so that all might understand the intentions and character of these parties. I have stated that the only competitor we have or are liable to have is oil, for I do not look upon the electric light as a competitor. At a meeting of our Association in May, 1881, I made some remarks on this subject, and from observations of the workings and use of the electric light in many places, I expressed the opinion that I believed the electric light would advance our business instead of diminishing it; that the more and stronger light used, and the greater facilities acquired for obtaining it, would result in a demand for more light. In the two years that have passed I have seen nothing to cause me to withdraw from the position then taken, but everything to strengthen and maintain it. The comparison of cost as between electric and gas light then made has been fully confirmed by subsequent information on the subject, and in fact the former has proven more costly than then set forth. From our present knowledge we can set down the arc light as costing from two and one-half to three times more than gas for an equal amount of light, and the incandescent system is still more expensive, while competent authorities inform us that "storage batteries are a snare and a delusion." We find in a recent issue of the *Brooklyn Eagle* the following:

"The writer disclaims any intention of anticipating the future, or of giving an opinion as to the ultimate success of incandescent lighting. It is the purpose of this article to sum up that which has been actually accomplished by the various applications of electricity—what has come from the elaborate promises that have from time to time been made by the electricians. That is all. In a recent interview Mr. Edison said that he had promised from season to season to light the district in New York, in order to 'keep up the courage of my stockholders, who naturally want to get rich faster than the nature of things will permit.' He describes the evils of the arc system and says the ruse of pretending to sell such lights will soon become apparent; indicates his thorough contempt for the secondary battery, and finally winds up with the following remarkable statement: 'If I show that electric lighting (incandescent system) is an exceedingly profitable business when done on a large scale, the public would be dissatisfied with the prices we demand. On the other hand, if I say we can compete with gas, and have to sell the electric light for about the same, then the investing public will put no money into it. So, you see, I am in a dilemma about making statements as to cost.' This was Mr. Edison's dilemma, and to some extent, if it had been stated at the outset, perhaps the whole of what followed would have been taken with a considerable discount. Still it is candid, and as such is a welcome contribution to the literature of financial dilemmas.

"Edison is still at work in the before mentioned district, wherein some of his lights are now in use. It is difficult to estimate the cost of a new and elaborate plant, its repairs, and the necessary adjuncts to the same which, it is found, must frequently be added; and so no one can yet say with precision just what an incandescent light costs per hour.

"Yet we have from those engaged in furnishing and using the light the fact that the cost of incandescent light exceeds from four to six times that of gas,

light for light. It has been clearly demonstrated by use and experience that the electric light in all its branches is too expensive, unsatisfactory, and unreliable for general purposes, and that the business is a speculation on the part of those who have the patents and apparatus to sell. The business is not being extended in places where it has been longest in use."

In the same article quoted above from the *Brooklyn Eagle*, we find:

"The electric light, in which the public is possibly more interested than in any other single electrical application, offers a good field for our initial examination. Nearly four years ago we were informed that it would rapidly replace gas as an illuminant. So positive were the electricians about this that even the gas people were frightened. Gas stocks fell and we looked forward to the electric light millenium.

"The electric light (Voltaic arc system) began to appear in our streets and thoroughfares, but the incandescent system—the small lights for dwelling houses—hung fire and may be said to be yet hanging, notwithstanding that it is in use to a very small extent now.

"Are the arc lights—the large electric street lights—increasing in number? By no means.

"Are they cheaper than gas?

"Let us turn for a reply to this question to the report of the superintendent of lamps and gas recently made to the New York Gas Commission: He says: One electric light, at 70 cents a night, costs the City of New York $255.50 a year. It displaces 6½ gas lamps, which, at $17.50 each per year, cost the city $110.83 a year."

"Here we have something tangible. What can, may and will be done is one thing; what is being done is another and is far more to the point. The only electric light companies that desired contracts for lighting the streets of New York for the year, beginning on May 1st, were two, each of which had already established a plant, wires and lamps in the districts which they purposed to light. For this service they ask, as will be seen, more than twice the sum demanded by the gas companies. Inferentially, therefore, they acknowledge that electricity by the arc system is more than twice as costly as gas.

"In a recent issue of the *Boston Transcript* there appeared the following editorial paragraph:

"The best that can be said in favor of electric light companies is that they are now endeavoring to do as little business as possible; for the more they do the more money they lose. Let any one investigate, even superficially, the business of the electric light companies in Boston, and he will find two classes of companies and none others. The first have stock for sale and care little to sell electric lighting. The second class are honorably managed by men of means, who offer no stock for sale, but are charging off their investment to profit and loss and frankly confessing that, until the business is reorganized upon a different basis, or new appliances have proved successful, there is no money in it, and that the more the business is extended the greater the amount of money lost."

"This will be a revelation to many, and yet if these same persons will investigate the matter, they will find as the writer has already found, that the paragraph quoted contains only a statement of cold facts.

"This being the case, the reader would, naturally enough, ask why then, if these electric light companies cannot sell their lights at a reasonable figure in comparison with gas, do they continue to do any lighting at all.

THE REASON FOR THIS

is not far to seek. It is alleged, and there would seem to be good evidence to sustain the assertion, that these big electric lights are kept in the streets in order to encourage capitalists in other parts of the country to buy electric light plants from the companies whose lights they see in operation. These plants and the right to use a certain system in a certain locality, is then sold to them at a large profit. The new company now started establishes its plant in an Eastern, Western or Southern State and offers the light for sale at the same price for which gas sells, candle power for candle power in luminosity, in that particular section. Pretty soon, however, the new company discovers that it is losing money rapidly, that in fact, as the *Boston Transcript* says, "the more business they do the more money they lose." This is a queer enterprise for business men to be engaged in, and when the aforesaid capitalists ascertain how things are going they make haste to inquire into the matter. "How is this?" they inquire of the New York or Boston company. "We cannot sell the light at a profit in our city; on the contrary, we are losing money all the time!"

"But they don't obtain much satisfaction from the parent company.

"Just now the newest scheme is to sell the complainers electrical storage batteries, by the intervention of which they can, to a certain extent, diminish the cost of supplying the light. At this they return home with lighter hearts, forgetting meanwhile that they have, by their new purchase, increased the amount of their original investment. The *Electrical Review*, which is the leading American authority upon electrical subjects, attempted in a recent issue to laugh away these charges.

"This is all very well, but we would like to have the *Electrical Review* put aside the consideration of the weather problem and the other problems by which it seeks to attract the attention of the *Transcript* from the main issue and answer the following questions:

"First—Is it not a fact that, as the *Transcript* says, these electric light companies now existing content themselves with selling electric plant, generously allowing other people to do the light selling?

"Second—Why is it that the electric light companies are not extending their plant in New York and Brooklyn?

"Third—Why is it that the two electric light companies that recently put in bids against the gas people only desired to light up the limited districts where now the plants are established?

"Fourth—If electricity, economically considered, is cheaper than gas as an illuminant, as has been claimed, why do the electric light companies demand more than twice as much as the gas people do for the same service?

"This much for the Voltaic arc system of electric lighting.

"The incandescent system has not had a trial on a large scale, or rather the innumerable small trials it has had would seem to have deterred most of its promoters from further effort. Mr. Edison's attempts in the district of New York City lying between Broadway and the East River, though begun some years ago, have resulted up to the present to little or nothing in a practical way, the few incandescent lights now in operation being insufficient to base an estimate of cost upon."

"The general public and those who have not investigated the subject have an erroneous impression with regard to the electric light, deriving their opinions from published statements of interested parties who have not only light, patents, and apparatus, but also stock, privileges, etc., to sell."

So the impression prevails that the electric light is a new discovery and that much is to be expected of it in the future, when the reverse is the case. The electric light is three-quarters of a century old, and about all has been realized from it that can be. Authorities inform us that although previously discovered it was first prominently brought out by Sir Humphrey Davy in 1808, 75 years ago. From that time to the present the best minds in the world, scientific and practical, have been engaged in perfecting it. This large amount of energy and intelligence employed in a single direction has resulted in placing electrical power far beyond that of any other known physical or mechanical system. In the report of the proceedings of a meeting of the Gas Institute at the Electrical Exhibition, London, in the Spring of 1882, and published in the AMERICAN GAS LIGHT JOURNAL in April of that year, we find some valuable testimony on this subject. I will quote from only one of the many who spoke on that occasion.

I would advise the members to read the whole account of the proceedings of that meeting.

Mr. Denny Lane, after speaking of the first exhibit of the electric light in London by Sir Humphrey Davy, and its progress down to the present time, says:

"I have now mentioned the Englishman who first showed the electric light, he who made the first experiment of converting mechanical force into electricity, the man who first carried that out on a large scale, and I must add the name of Mr. Justice Grove, who laid down the principles upon which the conversion of forces depends. All these subjects are as intimately connected with each other as conservations of energy, and I will show you how it affects the future of electricity. If the principle of Mr. Justice Grove had not been laid down, the electricians could point to what they would do. They could say, "We have done so much now, but we will do ten times as much in a few years." But I can point to the principle of Mr. Justice Grove, and show them that they can do little more than they have done already; because it has been established that all that mechanical force can do has been done, and that some 70 or 80 per cent. of the total mechanical energy is already converted into electricity—an amount of conversion not equalled, not even nearly approached, in any other branch of physical science. For instance, if we take the case of the steam engine, we find in the very best steam engines only 8 to 10 per cent. of the energy of combustion of fuel is turned into power; in gas engines we secure 18 to 20 per cent. of the heat produced by combustion; but in the electric engine we have arrived at this point—that already 70 or 80 per cent. of mechanical is changed into electrical power. Therefore I may say, "Thus far hast thou gone, but thou canst go no farther, because there is an impassable wall raised up by Nature." I think this is the most important point of all as to the future of the electric light. It is utterly impossible for ten thousand Edisons with ten thousand times his ability for *re-inventing*—for that is what it is—it is impossible for any man to get out of £100 more than £100. If any man puts one hundred sovereigns in his pocket, and goes to take them out some time afterwards, he will find through waste less than £100 in value. If you change a number of shillings into francs and back again into shillings, you will find you are short of the original number, for you must pay your broker; and therefore you cannot reproduce 100 per cent. You must lose something in all these changes of one force into another. The changes made by these electrical arrangements are wonderful in themselves but consoling to you, for you know that electricians can do no more than they have done. I am very glad that the electrical light has caused so much attention as it has created. Your President has happily expressed it by saying that we are not to look upon it as an enemy but as a friend. I think it is the best friend gas ever had.

* * * * * * * * * * *

"But I forgot to mention one other English name—that of a gentleman who

has contributed much to the progress of the electric light—Mr. Swan. He really invented the incandescent carbon lamp many years ago, and the reason he did not then succeed with it was that with the old air pump it was impossible to obtain a sufficiently high vacuum. The result was that the carbon filament burned away. Afterwards a German philosopher—Sprengel invented an air pump by which it is possible to produce a vacuum of 1-4,000,000th of an atmosphere. Mr. Edison did not invent the Sprengel pump, and the only reason Mr. Swan's lamp and the other incandescent lamps now come before us is that this air pump has been introduced in the interval, and has made it possible to have a more perfect vacuum."

History repeats itself in electric lighting as in other things, for we find that Mr. Edison's much vaunted incandescent light is but a facsimile of Sir Humphrey Davy's, and also of other modifications of it since that time. Davy's apparatus consisted of a glass tube placed horizontally, the wires from his galvanic battery of 2,000 pairs of plates entering the tube at either end, the wires being connected in the centre of the tube by a short piece of fine platinum wire. The ends of the tube were closed air tight and the air was exhausted. The resistance to the current from the battery passing through the fine wire heated it to incandescence. Hence its name. Mr. Edison, instead of using a glass tube, substitutes a pear-shaped glass in a vertical position, the wires from his dynamo passing through the neck of the vessel were at first connected by a fine loop of platinum wire, he now uses a bamboo carbon. The air is exhausted with the Sprengel pump mentioned above. Certainly history has repeated itself in this case, and Mr. Edison can claim no credit for an invention or discovery of the incandescent light.

Aside from the statement of Mr. Lane quoted above we have corroborative evidence from others, and it is now claimed that from 85 to 90 per cent. of the combustive energy of the fuel is converted into electric power. If this is an accomplished fact, only 10 or 15 per cent. is to be gained to reach perpetual motion; an event long sought for not yet found. One other point I will speak of for the benefit of our New England friends, viz.: the claim that, wherever water power was obtainable, there electric could compete with gas light. This is a fallacy, for from a carefully made statement of the cost of maintaining 48 electric lights for 1,200 hours with steam as the motive power it was found that the cost of the fuel was but nine (9) per cent. of the total cost. Now as water can not be had without expense, its cost would offset the wear and tear on the steam engine and boiler, so that all that is to be gained by water power is the above small amount of nine (9) per cent. Thus we see the present condition and the future prospects of the electric light from a practical stand-point. All will admit its expensiveness, and from its advanced state of developments but little if any reduction in the cost can be anticipated.

We who have been in the business of furnishing light for many years know that the people will not pay for such extravagant illumination, so I repeat that we need have no fears of the electric light as a competitor, but so long as it lasts, it will be a help to us in the prosecution of our business.

Discussion.

Mr. McDonald, of Albany, stated that practical tests had shown that the fuel used under the boiler in producing the arc light would give more light if converted into gas and burned. For example, 400 arc lights required 400 horse-power. These consume ten (10) tons of coal of 2,000 lbs. each, in ten hours. If each light equals three gas lamps, 1,200 gas lamps would be displaced. In Albany three foot burners had been used previous to the introduction of electricity, but allowing four foot burners, in which case the three gas lamps would give better satisfaction than the one arc light, the twelve hundred lamps would in ten hours consume 48,000 cubic feet of gas, which could be produced from less than five tons or one-half the amount of coal required for the 400 electric lights, and the city would be lighted in a more satisfactory manner.

Mr. Neal, of Boston, was called for and stated that a company of Boston capitalists sent a skilled electrician abroad to investigate the storage battery with a view to its introduction in Boston for supplying the electric light. The expert reported that the system had no commercial value and so the project of furnishing the light was abandoned. Mr. Neal continued: I think there is no need of gas men wasting time in talking about the electric light. We know there is nothing in it, and it will be but a short time before the general public will reach the same conclusion. Let us do all we can to reduce the price of gas and so increase our consumption. The increase in Boston has been something astonishing, so large, in fact, that a prominent officer of the Boston company informed me that they did not care to urge the use of stoves for heating or cooking as they had all they could do to furnish enough for lighting.

Mr. A. C. Wood—I do not agree with brother Neal that we should not talk about the electric light. I do not think we can talk about it too much. The paper which I read was not an argument but a plain statement of facts. We know that these companies are not formed for the purposes of legitimate business, and it is our duty as citizens to so inform the public.

Mr. Neal—I think that the public is now generally aware of these facts. It is well known in Boston that none of the electric light companies there are making money.

Mr. Harbison (Hartford, Conn.)—The bills for the Edison light in N. Y. are fifty per cent. more than the gas bills for the same place and the same length of time, and this with gas at $2.25 per thousand.

Mr. Harrington made a statement of the cost of running the electric lights at Niagara Falls, which corroborated the figures previously given. He said that the lamps run all night consumed four (4) carbons each, and these cost $62.50 per thousand, or a trifle over six cents each. This made an expense of 24 cents a lamp a night without considering labor, power, repairs and interest on plant. He did not think the company there had declared any dividends although having at their service the greatest water power in the world.

A vote of thanks was accorded Mr. Wood for his paper.

The secretary read a paper prepared by Mr. Geo. S. Page, on "Ammonia." (The paper presented by Mr. Page will be published in a subsequent issue of the JOURNAL.)

The secretary was instructed to express the thanks of the Association to Mr. Page for his valuable paper.

The committee on nominations reported the following names to serve as officers for the ensuing year:

President,	John McDougall	Hornellsville, N. Y.
1st Vice-Pres.	Wm. Cartwright	Oswego, "
2d "	D. M. Dunning	Auburn, "
Secy. & Treas.	W. A. Wood	Syracuse, "
Exec. Com.	F. C. Kingsbury	Corning, "
	J. H. Findlay	Ogdensburg, "
	Wm. Humphrey	Danville, "
	Wm. Parish	Seneca Falls, "
	M. Harrington	Niagara Falls, "

On motion of Mr. L. C. North, of Canandaigua, the secretary was instructed to cast the ballot of the Association in favor of the gentlemen named. The vote was announced and the gentlemen declared elected.

The president announced that the business of the meeting having been transacted, a motion to adjourn was in order and that thenceforth the members would consider themselves guests of the Bradford company; a programme had been arranged for Thursday which would include a ride on the narrow-gauge road through the producing territory, a visit to one of the gas wells, where the effect of torpedoing a well would be shown, and an inspection of the pumping station of the company. He announced further that through the kindness of the officers of the Rochester and Pittsburgh, and Erie roads, a special train would be at the disposal of the party, and that on their return from the pumping station a trip would be made to the great bridge over Kinzua gorge, the highest bridge in the world. In the evening all were invited to a banquet at the St. James Hotel.

A motion was made and carried that the thanks of the members be extended to the officers of the railroads mentioned for their kind invitation, and that the invitation be accepted.

A vote of thanks was also extended to Mr. Sawyer, General Freight Agent of the Rochester & Pittsburgh R. R., for his kindness in furnishing free transportation by special car from Rochester to Bradford and return.

On motion of A. C. Wood, seconded by Mr. Harrington, the thanks of the Central New York Association were extended to the members of the New England Association, who had come such a distance in response to the invitation to attend the meeting.

In response to this, speeches were made by Vice-President Harbison, Secretary Neal, and others of the New England Association, thanking the officers of the Bradford Co. for the glorious reception they had received.

At 10:30 P. M. the meeting adjourned for one year subject to the call of the president and executive committee.

Immediately after adjournment a joint meeting of the members of the two associations was called, and Mr. John Andrew, of Chelsea, Mass., was summoned to the chair. On motion of Mr. A. C. Wood, seconded by Mr. J. P. Harbison, the following resolutions were unanimously adopted:

WHEREAS, we the members present at a combined meeting of representatives of the New England and Central New York Gas Engineers' Association, held at Bradford, Pa., May 24th, 1883, learning with profound sorrow of the severe illness of Messrs. G. Warren Dresser of New York, and Lyman P. Gerould, of Manchester, N. H., be it resolved,

That our heartfelt sympathy be extended to each of them;

That we deeply regret their inability to be present with us at our meeting; and that we hope for their early recovery of bodily health and strength,

And be it further resolved, that the Secretary be instructed to incorporate these resolutions in the minutes of the meeting of the Central New York Association, and to forward a copy to each of the gentlemen named.

Thursday morning the members arose to find that the Bradford Gas Light and Heating Company—capable of anything—had ordered an end to the rain which had attended the convention thus far, and a bright sky heralded the pleasures of the day, the remainder of which was spent in an examination of the many wonders of the oil regions. It is needless to say that the greatest interest was taken in the novel and strange sights presented. The eventful day closed with a banquet, tendered to the excursionists by the Bradford Gas Light Company, and held at the St. James Hotel. Speech-making was participated in by President Hequembourg, Messrs. Harbison, McDougall, and others.

Friday morning the party left for the East, stopping over in Rochester, N. Y., long enough to visit the new Municipal Gas Works (Hanlon process) and enjoy a drive through the beautiful avenues of the city.

The treatment received here provoked another impromptu convention on the train, at which a vote of thanks was tendered to Supt. Matt. Cartwright, of the Rochester Gas Light Company, and Sec'y Scoville and Supt. Chase, of the Municipal, for courtesies received.

Thus ended the long anticipated, richly enjoyed, never-to-be-forgotten Bradford meeting of the Central New York Gas Engineers' Association

Price of Crude Oil.

During the past fortnight the market for crude oil has been very irregular, with a tendency to increasing prices. Certificates have been quoted as high as $1.25, and as low as $1.08. On June 13, the lowest price was $1.16⅞, and the highest $1.18⅝, closing at $1.18½. The volume of business transacted has been astonishing, and the prevailing tone appears to point to still higher figures.

The Market for Gas Securities.

The market for New York City gas shares for the past fortnight has shown considerable steadiness, and in some descriptions of stocks a decided advance is noted—Harlem we quote at 100 to 102; Municipal, 185 to 190, which will be marked as an advance of 5 points from previous quotation; Mahattan sells at 228 to 230, ex-dividend; New York is also stronger, 122 being bid; Mutual holds its last figure; and the same statement holds good for Metropolitan. Brooklyn shares are dull, Brooklyn, 107 to 110; Fulton Municipal shows no change, 69 being bid. Peoples gas is a shade stronger, we note sales at auction of this stock, June 6, 200 shares, at 49½, and 100 shares, June 13, at 49. At the election of Directors of Williamsburgh company, June 4, the "oil crowd" were successful. Mr. Bostwick says that the Standard only wants to sell naphtha to the gas companies; but it would seem that Mr. Rockfellar is willing to go into the gas business a little more deeply. The result of the election will be found in our "Item" columns.

In out-of-town shares, Hartford gas is stronger, 108 to 120; Baltimore gas still remains weak and depressed, latest figures 38½ to 39; Washington gas is stronger, and so is Laclede of St. Louis; we quote the latter at 96 to 100. We note a sale at auction of 27 shares Yonkers (N. Y.) Company, June 13, at 33.

Gas Stocks.

Quotations by Geo. W. Close, Broker and Dealer in Gas Stocks (with W. B. Scott & co.,)

34 Pine Street, New York City.

June 16, 1883.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share. ☜

	Capital.	Par.	Bid	Asked
Central	$466,000	50	85	90
Harlem	1,800,000	50	100	102
" Bonds	170,000		—	—
Manhattan	4,000,000	50	228	233x
Metropolitan	2,500,000	100	187	189
" Bonds	658,000	—	105	110
Mutual	3,500,000	100	116	118
" Bonds	1,500,000	1000	103	105
Municipal	3,000,000	100	185	190
" Bonds	750,000		102	104
New York	4,000,000	100	122	125
Northern	125,000	50	—	95
" Scrip	108,000			
Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	107	110
Citizens	1,200,000	20	75	80
" S. F. Bonds	320,000	1000	105	107
Fulton Municipal	1,500,000	100	69	71
Peoples	1,000,000	10	48	50
" Bonds	290,000	—	104	107
" "	250,000	—	88	90
Metropolitan	1,000,000	100	80	85
Nassau	1,000,000	25	59	—
" Ctfs	700,000	1000	90	93
Williamsburgh	1,000,000	50	70	75
" Bonds	1,000,000	—	100	101
Richmond Co., S. I.	300,000	50	70	75
" Bonds	40,000	—	—	—
Out of Town Gas Companies.				
Buffalo Mutual, N. Y.	750,000	100	72	75
" Bonds	200,000	1000	95	100
Citizens, Newark	918,000	50	80	85
" " Bonds.	124,000	—	105	10
Chicago Gas Co., Ills			150	155
Cincinnati G. & C. Co.			178	180
Consolidated, Balt.			41	42
" Bonds			105	106
Central, S. F., Cal.			43½	—
Capital, Sacramento, Cal			—	56½
Hartford, Conn	750,000	25	108	120
Jersey City	750,000	20	155	165
Laclede, St. Louis, Mo.	1,600,000	100	96	100
Montreal, Canada	2,000,000	100	186	187
New Haven, Conn		25	144	—
Oakland, Cal			—	29¾
Peoples, Jersey City			72	75
" " Bonds			—	—
Paterson, N. J		25	96	99
Rochester, N. Y		50	70	80
Washington, D. C	2,000,000	20	175	—
Wilmington, Del		50	174	—
Yonkers		50	33	35
St. Louis, Missouri	600,000	50	250	254
San Francisco Gas Co. San Francisco, Cal.			58¼	58½

Situation Wanted

AS MANAGER OF A SMALL GAS WORKS.

Thoroughly understands the manufacture and distribution of gas in all its branches. Has had ten years' experience. References good. Address "G. K," 306½ Saguna Street, San Francisco, Cal.

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Tar Burner and Tar Valve.

Simple in construction. Will not stop up, and gives the most perfect combustion, the tar supply being gauged exactly to the work required.

J. Fullager, Superintendent Cincinnati Gas Works, says of it: "That I have implicit faith in the superiority of your burner is exemplified by the purchase from you of 60 burners in addition to the two used on trial. I deem your Burner PERFECTION for the economical consumption of tar for heating benches."

Correspondence solicited.

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Established in 1864. Situated at Lockport Station, on the P. R. R., 60 miles from Pittsburgh, Pa. The Works consist of complete plant for manufacturing Clay Gas Retorts, Settings, Blocks, Tiles, and Fire Brick. Capacity, about 100 retorts, with necessary settings, and 100,000 fire brick per month. Clay and coal mined by ourselves within short distance of Works and hauled in wagons. Over three acres of land, with all necessary buildings, a number of tenements and town lots. The P. R. R. has side track alongside our kilns. Good trade established. Our good will and influence to go with sale. Statement of business done will be shown to responsible parties desiring to purchase. Any further information desired will be cheerfully given by Gardner Bros., Lockport, Pa.

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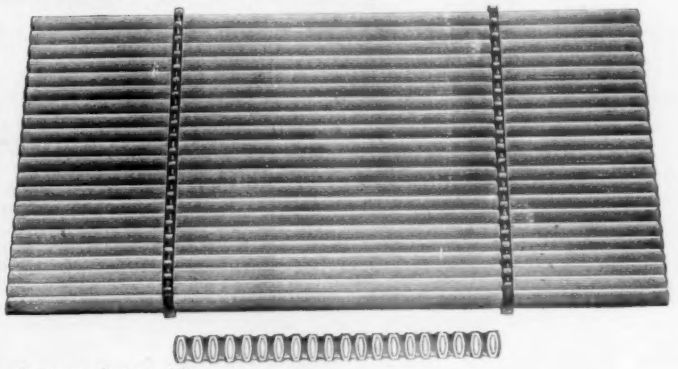

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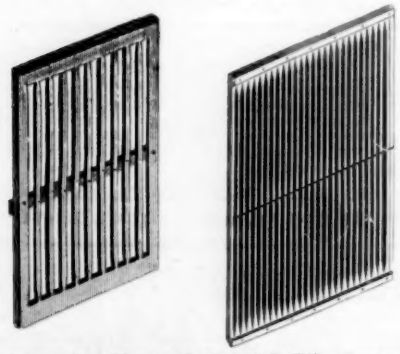

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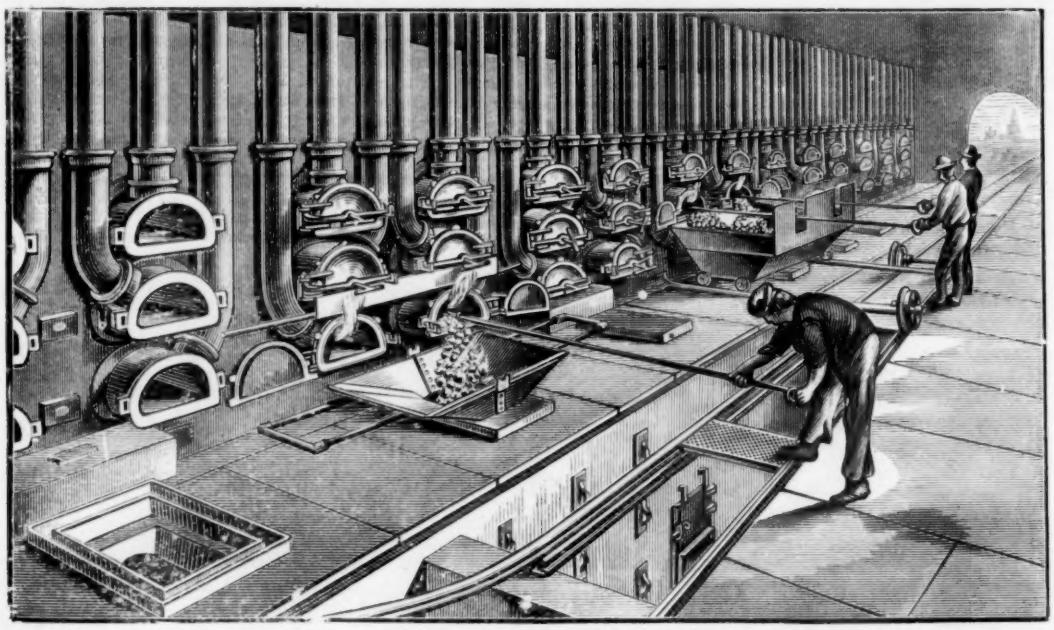

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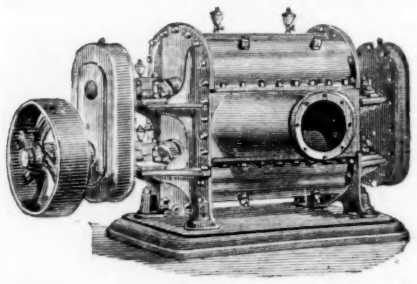

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Gentlemen:—In reply to your inquiry of the 1st, I have pleasure in informing you that our income from Ammoniacal Liquor is more than 3s. (72 cents) per ton of coals under present contracts. (Signed) H. WOODALL.

Messrs. KIRKHAM, HULETT and CHANDLER, Limited: THE GAS LIGHT AND COKE COMPANY, KING'S CROSS, Oct. 10, 1881.

Gentlemen:—In reply to your inquiry, I beg to say that the "Standard" Washer-Scrubbers erected at this station continue to give me full satisfaction. No. 1, which was put up in October, 1879, has been in constant use from that date without costing anything for repair, nor has the machine needed cleaning out. The No. 2 Washer, erected in 1880, has also worked quite satisfactorily. (Signed) JOHN CLARK, Engineer.

Messrs. KIRHAM, HULETT and CHANDLER, Limited: WATER AND GAS COMMISSIONERS' OFFICE, INVERNESS, Nov. 3, 1882.

Dear Sirs:—In answer to your inquiry of the 1st. inst., I have much pleasure in stating that the "Standard" Washer-Scrubber erected by you at our works is giving every satisfaction. Clean water run in at the outlet is converted into 24-oz. liquor. There are in all seven chambers, and the gas tested with turmeric paper at the sixth chamber shows no trace of ammonia. It requires very little engine power, and gives about nine-tenths of an inch back pressure. Our purifiers are purifying one-third more gas with the same quantity of lime. It is also a great relief to the men who empty the purifiers, as the disagreeable smell arising from the ammonia is entirely done away with. (Signed) JAMES THOMSON.

Messrs. KIRKHAM, HULETT and CHANDLER, Limited: DUKINFIELD, DENTON, AND HAUGHTON GAS WORKS, DUKINFIELD, Sept. 27, 1882.

Gentlemen:—Now that I have had a longer experience of your "Standard" Scrubber-Washer, I can give you, with greater confidence, the results derived from its use. In 1876 we made 138.2 lbs. of crude Ammoniacal Liquor per ton of coal carbonized; last year we made 235.7 lbs., or an increase of 70 per cent.; the strength of the former was probably 4°, of the latter it was 6.5°. The income from the Liquor in the former year was £320, last year 1,190, an increase of £870, or at the rate of 270 per cent. This increased income is, of course, partly due to the higher price of Liquor, but it is mainly owing to the increased strength and quantity through the use of your "Standard" Scrubber-Washer. Such figures as I have given speak more forcibly than any expression of opinion. (Signed) HARRISON VEEVERS.

THOMAS HERSEY, Esq.: THE GAS LIGHT AND COKE COMPANY, BECKTON, NORTH WOOLWICH, Feb. 2, 1882.

Dear Sir:—I send you on the other side some recent experiments that we have made with your Washers, and I am happy to say that they continue to give me satisfaction, as we are enabled, with very little trouble, to keep up the strength of our Liquor. (Signed) G. C. TREWBY.

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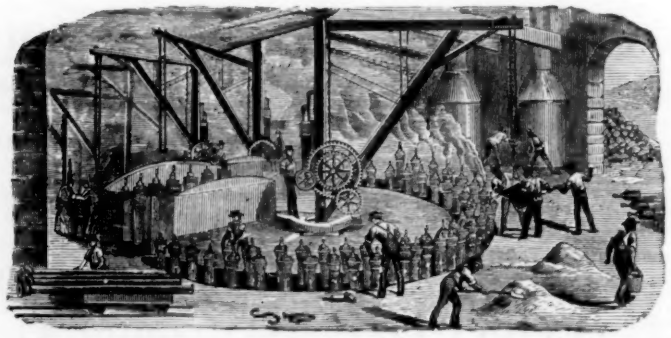

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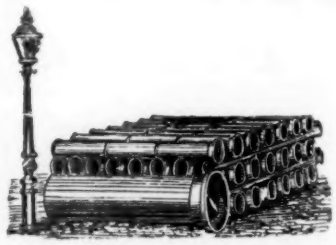

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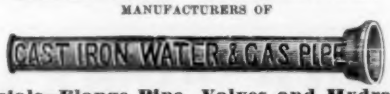

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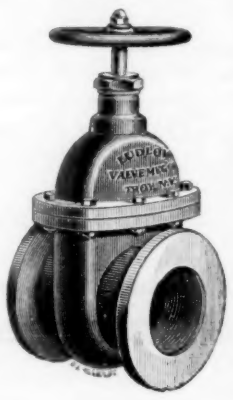

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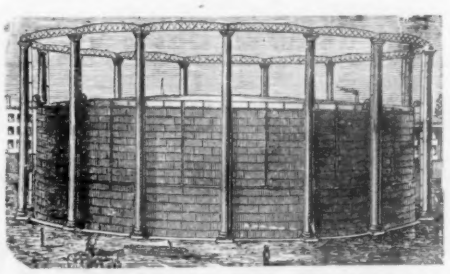

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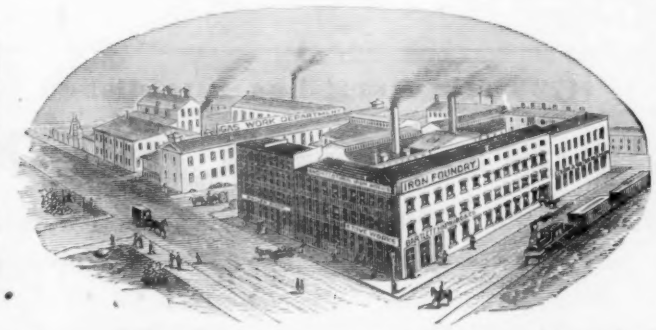

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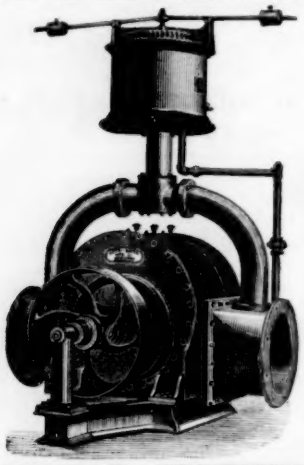

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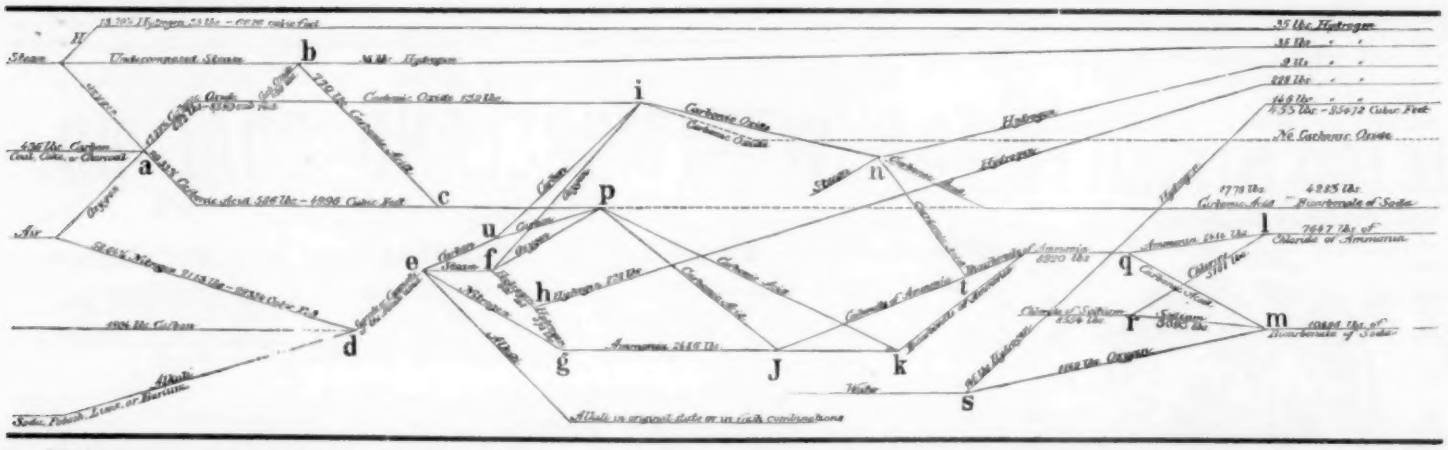

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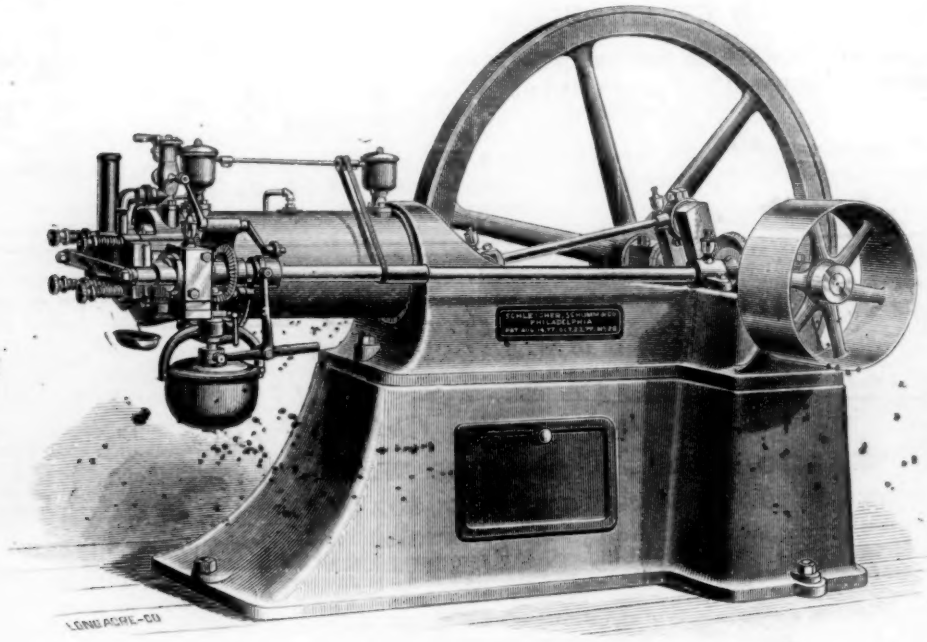

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